

RADIO

AMATEUR

NOVEMBER 1990

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THE WIA RADIO AMATEUR'S JOURNAL

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Cover

Bonnie Lindsay VK3BBL pictured at her mobile rig. For full story see ALARA notes on p 41.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Outback Odyssey

Back in July I really "stuck my neck out" when I said there was no doubt there would be sufficient depth for sailing on Lake Eyre by September, following the reports of the record floor in Cooper's Creek. In the middle of May the flow at Innamincka was 3500 cubic metres per second, and it didn't need much arithmetic to calculate that would fill the 27 cubic kilometres of Lake Eyre North in about three months, *if the flow stayed constant*. Of course, it did not stay constant. Instead of filling the lake by mid-August, the water had only reached the Cooper mouth on 17 August and, according to people who saw it, was not a flood but a trickle!

Nevertheless, a good Cooper flood is a rare sight, so (leaving the boat at home) your editor and his XYL set out for VK5 on 27 September, and

headed north from Adelaide on the 30th. In six days we covered almost 3000 kilometres, seeing such sights as the Strzelecki Track, with some water still in the Strzelecki Creek; the magnificent Cooper at Innamincka, a noble stream in the desert, but flowing at much less than one knot; and the road, barely even a track, from Innamincka north into Queensland. Four hundred kilometres of gibber plain! Sturt's Stony Desert all around. Still, we got through and made it to Birdsville, perhaps more than any other place the capital of the legendary Back of Beyond. Here is the other main river feeding Lake Eyre, the Diamantina. A big river too, with some water still, but no great flood. To fill the lake obviously needs record floods in both rivers at the same time.

South from Birdsville on the

famous Birdsville Track, 540 kilometres to Marree. Now a good enough road to cover its length in one day, even if it did write off one of our tyres in the process! By far the highlight of this leg (in fact, the main reason for the trip) was the ferry crossing of the Cooper, at least 100 metres wide at this point, and opening into a small lake with a big name, Killamperpunna, some two or three kilometres in diameter. From Marree back to Adelaide, with a night at Port Augusta, was back to sealed roads and civilisation!

I have held my amateur licence now for 43 years. For all that time my equipment has been "homebrew". But my trusty homebrew SSB rig is too big for the present car, so for this trip, and also to use in the boat, I "lashed out" and bought a new Japanese transceiver from one of our adver-

tisers. Editorial impartiality forbids me from naming the supplier or the model, but every day at 0300Z we checked into the Australian Travellers' Net, run so efficiently from Perth by Roy VK6BO and Peter VK6HH on 14.116MHz. Helped by VK5RI, VK3BTS, VK3CAU, VK3CAY, VK2IV and VK4MX (forgive me if I err with these call signs) they kept tabs on the daily whereabouts of 50 or 60 mobile tourist amateurs all over the continent. Not only that, but they have just begun an Indian Ocean maritime net at 1120Z daily, and have had up to 11 yachts participating there! A marvellous service, all call signs computer listed. A fine example of philanthropy in the true amateur tradition. And, on that happy note, it's back into harness for the next issue.

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Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing Australian Radio Amateurs - Member of the International Amateur Radio Union

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WIA NEWS

COMPILED BY WIA NATIONAL OFFICE STAFF

Band Planning Issues

In the October 1990 issue of Amateur Radio magazine, news from Ron Henderson VK1RH provided some background information regarding international band planning. In particular you will recall the PRIMARY service has first choice of frequencies in the band segment under consideration, sometimes followed by a PERMITTED service, then by one or more SECONDARY services which may be allocated to the same band segment. You will also recall

that SECONDARY services shall not cause harmful interference to stations of the PRIMARY or PERMITTED services and cannot claim protection from harmful interference from such stations.

Having re-iterated those points, we now revisit the RF tag identification matter, a subject which has caused concern to some members. During 1989 WIANEWS advised of correspondence with DoTC on the subject. DoTC were seeking the WIA's views on the authorising of Radio Frequency tag identification devices of both passive and active nature in a number of

frequency bands. The proposal included the 9 - 14 kHz, 70 - 160 kHz, 3.025 - 3.4 MHz and 3.5 - 3.95 MHz segments and advised that "In the USA these devices may be operated without a licence as they have a very low probability of causing interference to other users of the bands."

Unfortunately, to the best of our knowledge, there is no international standard for RF tag devices. In the USA they operate under FCC Part 15, a USA regulation which has proven of concern to the ARRL. Naturally, the WIA can only comment upon the last frequency segment which extends across the Australian 80 metre amateur band.

The International (ITU) Radio Regulations allocate 3.5 - 3.90 MHz in Region 3 (the Region which includes Aus-

tralia) to AMATEUR, FIXED and MOBILE whilst 3.90-3.95 MHz is allocated to AERONAUTICAL MOBILE and BROADCASTING. From this you will see both band segments involved are allocated on a PRIMARY basis to several differing services with no delineating priorities. Moving nearer to home the 1982 Australian Table of Frequency Allocations makes an allocation of 3.5 - 3.7 MHz to AMATEUR, 3.7 - 3.9 MHz to FIXED and MOBILE and 3.9 - 3.95 MHz to AERONAUTICAL MOBILE (OFF ROUTE). These allocations are repeated in the new draft Australian Spectrum Plan 1990.

From these frequency allocation details you can see the DoTC proposal conforms with PRIMARY Regional allocations and PRIMARY Australia-

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers	Weekly News Broadcasts	1990 Fees
VK1	ACT Division ACT Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Ted Pearce Secretary Jan Burrell Treasurer Ken Ray	VK1AOP 3.570 MHz VK1BR 2m ch 6950 VK1KEN 70cm ch 8525 2000 hrs Sun	(F) \$65.00 (G) \$52.00 (X) \$39.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Roger Henley Secretary Tim Mills Treasurer David Horsfall (Office hours Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG 1.845 MHz AM, 3.595 AM(1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52.120 SSB 52.525 FM(144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 564.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) \$59.00 (G) \$47.00 (X) \$33.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Jim Linton Secretary Barry Wilton Treasurer Rob Bailey (Office hours 0900-1600 Tue & Thur)	VK3PC 1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, VX3XV 147.225 FM(R) Mt Baw Baw VK3XLZ 146.800 FM(R) Mikdura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) \$65.00 (G) \$52.00 (X) \$39.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 294 9075	President Murray Kelly Secretary Eddie Fisher Treasurer Eric Fittock	VK4AOK 1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, 147.225 FM(R) Mt Baw Baw VK4ABX 147.225 FM(R) Mt Baw Baw VK4NEF 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) \$65.00 (G) \$52.00 (X) \$39.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Rowland Bruce Secretary John McKellar Treasurer Bill Wardrop	VK5OU 1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT) 3.555, 145.500, 0900 hrs Sunday	(F) \$65.00 (G) \$52.00 (X) \$39.00
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3988	President Alyn Maschette Secretary John Farnan Treasurer Bruce Hedland - Thomas	VK6KWN 146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) \$56.00 (G) \$45.00 (X) \$30.00
VK7	Tasmanian Division 48 Denwent Ave. Lindisfarne TAS 7015	President Tom Allen Secretary Ted Beard Treasurer Peter King	VK7AL 146.700 MHz FM (VK7RH) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNV), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) \$63.00 (G) \$50.00 (X) \$36.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).		Membership Grades Full (F) Pension (G) Needy (G) Student (S) Non receipt of AR (X)	Three year membership available to (F) (G) (X) grades at fee x 3 times

Note: All times are local. All frequencies MHz.

lian allocations in the segment 3.7 - 3.9 MHz. You can also see that below 3.7 MHz DoTC are free to make an Australian SECONDARY allocation should they so desire.

This means that, in the real world, the WIA cannot stop an allocation by DoTC provided it is within the ITU Radio Regulations. Therefore the tactics the WIA adopts must be chosen to have a chance of succeeding. The approach the WIA took in this instance was to examine the proposed power levels and consider the circumstances in which those powers might be radiated.

The WIA considered applications might include tagging shipping containers for air, sea and road services. As these generally are located in industrial areas when interrogation might occur, this gave the WIA a feel for the comparison of their radiated signals with the prevailing man made noise level powers. The WIA also considered that RF tag devices might be used for tagging high value articles in shops, for pets and for imprisonment in the home. This led the WIA to do the noise power comparison against "quiet rural" CCIR standards.

As the comparison was unfavourable, the WIA advised DoTC it could not accept the proposal, a fact which was reported in WIANEWS last year.

DoTC responded at a later date confirming some of the WIA's calculations and proposing a significantly lower power level for the 3.5 - 3.7 MHz amateur PRIMARY service segment. As that power level now equated to the CCIR "quiet rural" figures the WIA replied it believed the level was acceptable to the amateur community.

In practice, at a distance from the devices, their radiations would only be detected by long term monitoring of the noise floor level.

The WIA did not "give permission" for a SECONDARY service on 80 metres. It did ensure the possible SECONDARY service proposal by

DoTC was not at an adequately low noise power level so as to be barely discernible.

This was also reported in a later edition of WIANEWS last year and the WIA's insistence on the issue by the Minister of an Australian standard for RF tag devices was also reported in some detail. The WIA has also advised the three IARU Regions, the ARRL and the RSGB about these RF tag device proposals.

In making its response the WIA considered the frequency of use and potential locations of RF tag devices and was of the opinion their nuisance was of a similar order to the routine ionosonde and allied scanning radiations that regularly sweep across the HF bands.

When arguing issues such as this the WIA must make a risk analysis, for we cannot "cry wolf" all the time and take every issue to the Minister. The WIA has, and will, continue to pursue with all vigour issues we believe we have a reasonable chance of winning (do you watch Rumpole?). In addition, we will always do damage control assessments and action on the other issues.

Summing up, DoTC and not the WIA make frequency allocations in Australia and, unlike some other nations, the WIA is not aware of any legal obligation upon DoTC to consult with other spectrum users. Fortunately, it is the current government's policy to seek public comment, so the WIA is able to influence those issues where the considerations support the radio amateurs' case.

Amateur Radio Magazine

Without question Amateur Radio magazine is the most tangible advantage offered to Australian radio amateurs as a benefit of membership of the WIA. It is the "flagship" of WIA efforts to gain new membership and retain existing members.

Amateur Radio magazine has a great, 58 year history of

production, mainly by volunteers. But, let us all face reality. The production of the present magazine is mostly the work of the paid Managing Editor, Graham Thornton, and the paid staff of the Executive Office. The volunteer effort has rapidly declined in recent times to just a handful of people.

Amateur Radio has been, and still is, an ad hoc publication. The editorial policy remains that everything submitted by members is published (unless totally and irresponsibly incorrect), more or less in the order received, and with a minimum of editing.

Since its inception Amateur Radio has been treated primarily as a membership technical journal, with technical articles being the first priority. But the winds of change are blowing relentlessly through amateur radio right around the world. The true amateur experimenter, who actually constructs and/or repairs his radio equipment, is rapidly becoming a smaller and smaller minority. The "technicians" amongst radio amateurs are no longer sufficient to justify a primarily technical journal.

The best technical amateur radio magazine in the world, "Ham Radio" has just folded; "QST" and "Radio Communications", the two leading amateur radio society journals in the world, have been relentlessly moving further away from their traditional roles as technical journals in response to the changing needs of their readers.

The WIA believes it is important to the future of the WIA that Amateur Radio magazine also consider change.

Should Amateur Radio magazine change from a primarily technical journal?

Should technical articles generally tend more towards add-ons/preamplifiers, antennas and ATUs, power supplies, etc, etc; modifications to existing equipment; weekend projects; and items of particular interest to the new or be-

ginning amateur, rather than complete transceivers?

Should technical reviews of radios and ancillary equipment take a much higher profile?

Should book reviews appear in each issue? Should a column for the new, non-technical amateur be introduced?

It is your magazine. What do you think?

Amateur Radio 20 Year Index

Since its introduction early last year, the Amateur Radio magazine 20 Year Index, available to WIA members on an IBM format 5 1/4 inch floppy disk in either ASCII or dBase .DBF file, or as hard copy, has proved to be very popular.

The index starts from the January 1968 issue of Amateur Radio, and is now almost a 22 year index. As a further service, the index has now also become available from the Executive Office of the WIA on an IBM format 3 1/2 inch floppy disk at the same low price of \$10.00, which includes the disk, packing and postage.

WIA and Jordan Activities

From the outset it must be stated the WIA neither sponsors, supports nor decries amateur activities concerned with refugee relief in Jordan. The WIA's policy on assistance to the civil community is contained in two policy statements adopted by Federal Council in 1983.

The first concerns WICEN, that arm of amateur radio devoted to providing communications, upon request, to disaster control agencies within Australia. Any national or international requests to WICEN would come through the Australian Government coordination agency, the Natural Disasters Organisation whose headquarters is in Canberra. Incidentally, no such requests have been received concerning Jordan.

The second policy statement is concerned with third party traffic nets. The WIA recognises these as but one of the many facets of amateur radio operating and as such supports third party traffic nets conducted within the DoTC regulations. Australian amateurs are free to take part in any international traffic nets provided they operate within the conditions of their licences. There are conditions, also, on soliciting for traffic.

The Australian amateurs seeking support to provide relief communications for refugees in Jordan are doing so as individuals. They have not sought WIA support or sponsorship and, to their credit, they have never implied any such support.

Regrettably some vocal and less informed amateurs have seen fit to denigrate those efforts, possibly in a libellous way and, by their actions, bring discredit upon the Australian amateur service. The WIA implores them to use the correct channels of debate through their WIA Divisions. The packet media is a powerful means of spreading information, therefore care must be taken to keep it as accurate as possible.

Incidentally, for those genuinely interested in disaster communications, the WIA recommends the report to the ARRL Council published in QST for March and April 1990. The real effectiveness of amateur communications is assessed in an analytical and impartial manner.

ARRL Emergency Communications

The American Radio Relay League (ARRL) set up a National Emergency Response Committee (ANERCOM) which recently made its final report to the ARRL's Board of Directors. The summarised report is contained in QST for March and April 1990. It includes a number of matters which will be of interest to Australian amateurs, particularly those involved in emer-

gency communications.

The report initially identifies the role of the IARU and the supported agencies in the USA; it then goes on to examine in some detail the several issues which are set out below.

Data Base

The need for a current data base, containing telephone numbers and addresses of amateurs active in emergency communications is seen as essential for the controlling agency.

News Media Interface

The ability to provide accurate information to news agencies is identified, observing that this activity must be handled well to obtain the maximum exposure for the amateur service.

Traffic Nets

Disaster nets are arenas of high tension and anxiety. People accustomed to day-to-day net controlling are sometimes completely out of their element during an actual emergency. ANERCOM observes a need for special training for net controllers.

To quote: "ANERCOM has wrestled with the question of health-and-welfare (H&W) traffic. H&W inquiries should flow out of the affected area to concerned relatives and friends. One such outgoing message can potentially head off half a dozen ingoing messages. Also, most H&W traffic sent from outside the affected area to the victims of the disaster remain undelivered. This is because the lack of telephone service, dislocation of the population and a general inability to deliver H&W traffic when more strategic needs of the population must be met with limited communications resources.

The Committee considered recommending a policy of non acceptance of "incoming" H&W traffic. It weighed the possible loss of credibility by not delivering much of the traffic against the eagerness of the Amateur Radio population at large to accept such traffic regardless of consequence. It decided that the following procedure was the

Club Contest

BOOST YOUR CLUB FUNDS

Help your club and give added strength to the WIA to protect Amateur Frequencies from Government and Commercial Attack

HOW?

Simple! Sign up a new member between 1st October and 31st December 1990 and the WIA will pay your radio club a recruitment fee of \$5.00.

In addition, the club which signs up the most new members wins a free three year membership of the WIA PLUS three great amateur radio books for the club library.

Every radio club is a winner in this competition! The WIA is a winner! The amateur radio service in Australia is a winner!

WHO CAN ENTER THIS CONTEST? Every radio club in Australia which holds an amateur call sign, whether the club is affiliated with the WIA or not.

WHO QUALIFIES TO BE A NEW WIA MEMBER? Any person in Australia who has not been a member during the immediately prior 12 months.

HOW DO YOU SIGN UP A NEW WIA MEMBER? If your club does not have a supply of WIA membership application forms, then use the form printed on the back of every Amateur Radio magazine fly sheet - even photocopies of that form will suffice.

WHERE DO YOU SEND THE NEW WIA MEMBER APPLICATION? Send the application, together with the full membership fee as shown on page 3 of Amateur Radio magazine, to your local WIA Division.

HOW DOES YOUR CLUB CLAIM ITS FEE? The club secretary writes, on club letterhead, to "WIA Club Contest, PO Box 300, Caulfield South, 3162" with details of the new WIA member. At the end of each month of the contest a cheque for the total amount of all \$5.00 recruitment fees due to the radio club will be forwarded.

The club which wins the grand prize of a free three year membership of the WIA, plus books for the club library, for signing up the most new WIA members, will be announced in February 1991.

Get to work now in this great fund raising contest where everybody is a winner!

best compromise:

1. *Accept incoming health and welfare traffic, but advise the sender the chances of delivery are slim or at the best delayed.*

2. *Send the H&W traffic to the closest point of delivery until it can be taken into the affected area and processed.*

3. *Work towards better collection of outgoing H&W traffic from the affected area. (Work with supported agencies to prepare potential victims to carry names, addresses and phone numbers of friends and relatives they would want to notify. Their address books should be on the list of evacuation supplies taken with them to shelters.)*

4. *Work with IARU member organisations to establish better H&W traffic collection procedures in shelters and displaced-person camps."*

Gateways

Gateways to interconnect multiple modes of transmission and multiple nodes are starting to appear. Their further development around the country is recommended by ANERCOM.

Software and Hardware

The automation of gateways relies heavily on the development of additional firmware which will automate many of the processes now requiring operator intervention. The next logical step is to be able to port messages between any digital modes through multiple ports of a single computer. This should include CW, RTTY, AMTOR, packet and land-line ASCII transfer.

Message Format

Message format remains perhaps the most controversial issue of H&W disaster communications. For example AMTOR does not support the full ASCII character set and there is perhaps a reluctance to adopt ARRL message numbers. ANERCOM feels that message simplification is important, as long as message numbers are translatable in the disaster area. They propose the ARRL message numbers be recommended to IARU for international use.

Standard Operating Procedure

The "watch officer" concept proposed by ANERCOM is the key to activating the Standard Operating Procedure (SOP). Its broad components include:

(A) Telephone call-up of supported agencies and amateur officials to establish continuous liaison for the duration of the emergency;

(B) WIAW activation by the Net Manager;

(C) WIAW activation as an emergency station with a presence on IATN;

(D) Activation of the WIAW emergency bulletin schedule;

(E) Offering of equipment or personnel assistance to the affected areas; and

(H) ARRL HQ's interface with news media.

Debrief

In the aftermath of a given disaster, ANERCOM proposes that the ARRL critique its response with the supported agencies.

How Does This Affect the WIA? Well, many of the points observed by the ANERCOM are applicable to amateur radio emergency communications in Australia. The matter of acceptance and delivery of H&W traffic into a disaster area is very pertinent, so much so that the WIA would strongly advise against soliciting for such inwards traffic, despite the natural inclination of amateurs to try to help in this manner.

The WIA, through its WICEN organisation, has observed in the past the role of the amateur operator in emergency situations is to provide the initial response, before the regular communications services can be re-established. This means the amateurs' involvement tapers off after a few hours or days and amateur communications can then be stood down. To that end it is generally the amateur operators on the spot who can provide that first response and it is they, or in reality every amateur, who must be prepared to operate in an emergency.

Frequency Management Submissions

The House of Representatives Standing Committee on Transport, Communications and Infrastructure recently called for submissions from the public on management of the radio frequency spectrum. The WIA responded in writing and offered to give verbal evidence to the committee if required.

The WIA said that in circumstances where a single agency would manage the spectrum it would be difficult to go beyond the services already provided by DOTC. The one reservation the WIA had was the apparent inability of the Department to effectively control unauthorised use of the spectrum. One advantage of this arrangement is the proximate nature of the licensing and regulatory responsibilities.

An alternative management structure would be to appoint several agencies, with the division of responsibilities determined by customer requirements or application areas. Thus one could envisage separate agencies dealing with, for example, coastal and maritime, aeronautical, land mobile, broadcasting, amateurs and so on. In these circumstances the WIA would have to consider bidding for the agency responsibilities for amateur spectrum.

In respect of equitable access to spectrum, the WIA believes national adherence to the ITU Radio Regulations for amateur allocations within Region 3, suitably modified because of geographic and regional considerations associated with the size and remoteness of our continent, is the minimum acceptable situation.

The WIA responded to the recently issued draft Australian Spectrum Plan, drawing attention in particular to circumstances where proposed sharing could lead to interference problems with international amateur radio satellites. The WIA also proffered the view that issue of a new plan

only a year before WARC 92 could lead to difficulties, for the plan could have only a limited life for some frequency bands. A revised plan immediately after the WARC, incorporating its decisions, was preferred.

The WIA believes allocation of spectrum to users with highest value smacks of "selling off spectrum" to the highest bidders, without regard to its true worth to humanity on the broader scale. The intrinsic implication that financial overtures determine its real worth is emphatically denied.

A similar review was conducted several years ago in the United Kingdom and the analogy was made in the report ("Deregulation of the Radio Spectrum in the UK" by CSP International, HMSO.) to land and its use. Crown land was available for lease or sale but small pockets were designated parks for public recreational use by non-commercial interests. In the radio spectrum those parks equate to amateur allocations (and to a much lesser extent Citizens Band (CB) channels). The WIA would defend any attempts to "sell off" amateur spectrum to amateur or other users.

It is extremely difficult to devise an equitable valuation system for non-commercial spectrum. Some of that spectrum enhances a nation's research and development capability (industrial, scientific, and medical), some contributes to international space research. With regard to amateur spectrum, the secondary worth to Australia of self training, intercommunication and technical investigation is hard to cost. However, due acknowledgment must be made of its use by youth as well as by senior citizens in this age of "increasing leisure time".

The WIA holds the views that spectrum management must be responsive, but in a smooth and steady manner without major upheavals, except perhaps where external influences such as WARC's intrude. The system must also be matched to the life of the

equipment installed, for commercial owners must be able to amortise capital investments over a reasonable number of years without being forced to adopt the latest technology. Indeed, changes in technology should be the driving influences for changes to allocations, with obsolete and spectrum inefficient technology being permitted for an additional equipment generation if spectrum permits, but at a service use (licence) premium.

For the amateur, the nature of equipment sources suggests broad application standards can be applied through the setting of permitted modulation modes and bandwidths, not unlike the current licence conditions in DOC71.

The WIA cautioned against setting high profit demands, for the associated high use fees (licences) inevitably lead to unauthorised operation, a problem the present spectrum management agency (DoTC) is not coping with well. Indeed, the matter of regulatory constraints was not specifically addressed in the Terms of Reference and is a difficult consideration.

The WIA asked would these regulatory powers be also devolved to the spectrum management agencies and would the agencies be able to achieve a better track record of prosecutions than DOTC's dismal performance? The WIA has its serious reservations on this matter.

The WIA is also concerned that the need for profits would be greater with agencies, for not only do the agencies have to make a profit on their operations, but also portion of those profits must finance regulatory activities (for the fines will be inadequate), but a surplus can be provided to government revenue.

It is the present experience of the amateur service that little regulatory effort is expended upon its complaints and any devolution of spectrum management to agencies will only exacerbate the cost to service ratio. Consequently,

in examining any proposals to create spectrum management agencies, the WIA recommended it would wish to see each application specific agency working to its own specific government directed profit formula, which would closely relate costs to quality of services provided.

WIA Badges

Are you aware the WIA has two badges? Yes, in addition to our historical emblem, based on the Australian map, including Tasmania, a sore point from the early 40's, with superimposed "wings" and "lightning flash", we also have an alternative badge. It's fashioned around the international amateur radio diamond badge, used in various forms by most of our sister societies.

It was approved as an alternative WIA badge at the 1980 Federal Convention, the final design being derived from an idea put forward a year or two earlier by Bill Roper, VK3ARZ, now the WIA General Manager. This badge is diamond shaped, bears an antenna and an earth symbol, connecting to a capacitor in the centre. Between the plates of the capacitor appears our logo WIA.

For those interested in history, our winged emblem has a long and ancient background. It appears to have been designed a year or two before 1922. The "wings" and "lightning motif" are said to have derived from an Army Wireless Unit badge of World War 1. They also formed a large part of the RAAF Wireless Reserve emblem authorised in 1935.

If you are thinking of going overseas, and wish to be recognised internationally as a radio amateur, we suggest you procure one of these diamond badges. Divisional bookshops hold stocks or you can send \$4.00 to the Executive Office for one.

Contest Rules

Each year, at the Federal Convention, when the Federal Contest Coordinator reports

MAGPUBS

ANTENNA BOOKS

The ARRL Antenna Handbook 15th Edition	#BX161	\$36.00
Antenna Compendium Volume 1 ARRL	#BX163	\$22.00
Antenna Compendium Volume 2 ARRL	#BX292	\$24.00
Antenna Compendium Volume 2 & 10M PC Disk ARRL	#BX294	\$36.00
Antenna Impedance Matching ARRL	#BX257	\$30.00
Yagi Antenna Design ARRL	#BX164	\$30.00
WIFB's Antenna Notebook Doug DeMaw ARRL	#BX179	\$20.00
Novice Antenna Notebook Doug DeMaw ARRL	#BX162	\$16.00
Practical Wire Antennas John E. Heyes G3BUD RSGB	#BX296	\$28.00
HF Antennas L.A. Mason G3XN RSGB	#BX296	\$28.00
ANTENNAS 2nd Edition John D. Kraus WB4X	#BX258	\$104.00
Antenna Handbook William I. Orr W6SAI & Stuart D. Cowan W2LX	#BX217	\$17.30
Vertical Antenna William I. Orr W6SAI & Stuart D. Cowan W2LX	#BX220	\$15.85
Beam Antenna Handbook W. I. Orr W6SAI & S. D. Cowan W2LX	#BX215	\$19.80
Wire Antennas William I. Orr W6SAI & Stuart D. Cowan W2LX	#BX215	\$17.30
Cubical Quad Antennas W. I. Orr W6SAI & S. D. Cowan W2LX	#BX214	\$14.50
The truth about CB Antennas W. I. Orr W6SAI & S. D. Cowan W2LX	#BX219	\$17.30
Transmission Line Transformers J. Savick W2FMI New 2nd Ed	#BX134	\$46.00

SATELLITE BOOKS

Oscar Satellite Review Dave Ingram K4TWJ	#MFJ31	\$17.00
Satellite Experimenters Handbook Martin R. Davidoff ARRL	#BX177	\$25.00
Satellite Anthology The ARRL	#BX180	\$16.00
AMSAT-NA 5th Space Symposium 1987 AMSAT-ARRL	#BX182	\$17.50
AMSAT-NA 6th Space Symposium 1987 AMSAT-ARRL	#BX189	\$17.50
SPECIAL the 2 books 5th & 6th Symposium	#BX5007	\$25.00
Space Almanac Anthony R. Curtis ARRL	#BX299	\$40.00

PACKET RADIO BOOKS

Gateway To Packet Radio Stan Kerepa WA1LOU 2nd Edition	#BX188	\$24.00
The Packet Users Notebook Buck Rogers WA8BT CQ	#BX285	\$18.50
Packet Radio is Made Easy Buck Rogers WA8BT MFJ	#MFJ32	\$20.50
A25 Link Layer Protocol ARRL	#BX178	\$16.00
Computer Networking Conferences 1 - 4 1981 to 1985 ARRL	#BX186	\$28.00
Computer Networking Conferences 5th 1986 ARRL	#BX187	\$20.00
Computer Networking Conferences 6th 1987 ARRL	#BX188	\$20.00
Computer Networking Conferences 7th 1988 ARRL	#BX184	\$25.00
Computer Networking Conferences 8th 1989 ARRL	#BX295	\$24.00
SPECIAL - All 5 Books - Conferences 1 to 8	#BX3006	\$80.00

VHF/UHF/MICROWAVE

RSGB Microwave Handbook Volume 1 M. W. Dixon G3PFR RSGB	#BX318	\$70.00
VHF-UHF Manual George Jessup G3JP RSGB	#BX267	\$46.00
all about VHF amateur Radio William Orr W6SAI	#BX216	\$17.30
21st Central States VHF Conference 1987 ARRL	#BX172	\$17.50
Mid-Atlantic VHF Conference Dec 1987 ARRL	#BX175	\$17.50
21st Central States VHF Conference 1988 ARRL	#BX173	\$17.50
23rd Central States VHF Conference 1989 ARRL	#BX268	\$17.50
Microwave Update 1987 Conference ARRL 1987	#BX174	\$17.50
Microwave Update 1988 Conference ARRL 1988	#BX174	\$17.50
Microwave Update 1989 Conference ARRL 1989	#BX213	\$24.00
UHF Compendium Part 1 & 2 Volume 1	#BX260	\$49.95
UHF Compendium Part 3 & 4 Volume 2	#BX251	\$49.95

HANDBOOKS

ARRL 1990 Handbook ARRL Hand Board	#BX287	\$52.95
The Operating Manual ARRL	#BX192	\$30.00
The ARRL Electronics DATA BOOK ARRL	#BX201	\$24.00
Radio Data Reference Book G.E. Jessup RSGB	#BX189	\$36.00
Radio Communication Handbook Fifth Edition RSGB	#BX244	\$55.00
Radio Handbook 2nd Edition William I. Orr W6SAI	#BX2424	\$49.50
Motorola RF Device Data Motorola 2nd Edition 2 Book Set	#BX5047	\$24.50

MAPS

Preflex Map of the World Radio Publications	#RX234	\$8.00
Preflex Map of North America Radio Publications	#RX235	\$8.00
Radio Amateurs World Atlas Radio Publications	#RX236	\$8.00
Madhead Locator - World Grid Atlas ARRL	#BX187	\$10.00

The above books, plus many more, are available from your VOA Divisional Bookshop. All items are less 10% discount for WIA Members and are plus postage and handling where applicable.

All Prices are Subject To Change With-out NOTICE
If not in stock at your Divisional Bookshop, your order will be taken and filled promptly. Not all publications are available from all Divisions. * Price Changes --> price Reduced --> Price Increase

to Council, much discussion, some anguish, and considerable hot air is expended in considering the report. Motions are made to change contest guidelines and the annual cycle is repeated once more. Sadly, it appears as though we are not making a lot of constructive progress in refining our contests, that is if one is to believe the views expressed over the air and in print in the "Over to You" columns of Amateur Radio magazine.

At the 1990 Federal Convention the WIA, observing the heavy workload and constant abuse heaped upon the Federal Contest Manager, who incidentally is appointed for a three year term, divided up the duties. There is now one Federal Contest Coordinator, Neil Penfold, VK6NE, and a Contest Manager for each of the five WIA managed contests. The Contest Managers set the rules, working within Council guidelines, provide Amateur Radio magazine with contest notices, score the logs and provide the results for publication and issue of certificates and trophies by the Executive Office.

How does this affect you? Well, if you are unhappy with any contest rules put your thoughts down on paper, not forgetting to provide full reasoning, and send them off to Neil Penfold, or to the Executive Office, and they will be forwarded to the appropriate Contest Manager.

Incidentally, the WIA is looking to standardise on a log sheet format and a common front cover sheet layout for all our contests. In due course they should appear as sponsored inserts in Amateur Radio magazine for you to use as photocopy masters.

FTAC Communications

The Chairman of the Federal Technical Advisory Committee (FTAC), John Martin VK3ZJC recently reported to Executive that he had an effective network in place for technical communications with the Divisions.

John has a communicating member in each Division and, whilst the turnaround of mail is not that fast, he is generally getting answers. This has prompted John to ask, are those answers the consensus view of members? Do Divisions include FTAC news in their broadcasts and at meetings, or does the FTAC representative give the answer he or she believes applies with minimum consultation?

To provide an additional avenue for FTAC news John regularly provides notes for inclusion in Amateur Radio magazine. Do you read his column and do you pass your views to your local FTAC correspondent or Federal Councillor, or even write to John?

Remember, the quality of our technical decisions are only as good as the information John receives.

WARC 92 Donations

It was pleasing to see that the Amateur Radio News column in October's issue of Electronics Australia made mention of the WIA's role in commenting on proposed changes to the Australian Spectrum Plan.

The article quite forcefully made the point that "the WIA is essentially acting in the interest of all Australian amateurs, not just those who are its members. Any privileges gained as a result of WIA representations are always available to non-members, as well as members. However, representing the interests of Australian amateurs in both national and international decision making arenas is costly, and funded directly by WIA members. Its therefore a good idea for as many hams as possible to lend both their moral and financial support to the WIA, by joining up."

It naturally follows that the WIA would be pleased to receive donations to the WARC 92 fund, and at this point acknowledgment must be made of the substantial donations received from a couple of radio clubs, and several individuals.

Has your club considered making a collection or running a raffle at a hamfest or on a meeting night and donating the proceeds to the WIA WARC 92 fighting fund?

Canadian Amateur Licence Restructure

News is to hand that the restructured Canadian Amateur Service commenced from 1st October. Interesting changes include the introduction of a new entry level licence.

This Basic Qualification examination consists of 100 multi-choice questions, 25 on regulations and the remainder on radio theory and operating procedures. The holder of this entry level licence may operate on all amateur frequencies above 30 MHz, using all classes of emission, but must not use "home built transmitters".

If the holder of the Basic Qualification licence also holds a 5 WPM Morse Qualification, they may additionally operate on all amateur frequencies below 4.00 MHz, but again must not use "home built transmitters".

WIA Membership

The Australian amateur service has WARC 92 looming on the horizon, and is subject to rapidly increasing commercial pressure on our frequencies. This is a time when a financially strong WIA is particularly needed, both in Australia and internationally.

What a pity that government fiscal policy is presently creating such economic difficulties.

In the past six months, although the number of new members joining the WIA has held steady, the number of existing members dropping out has increased.

The most common reason for non-renewal of membership is financial hardship. Many such people advise that they still support the WIA, but economic conditions have forced them to re-assess their financial priorities.

Of the 18,000 plus licensed radio amateurs in Australia only 7000 are presently members of the WIA. **This means that over 13,000 Australian amateurs are not supporting the fight, nationally or internationally, to protect our frequencies or privileges!**

Think about this for a moment. If WIA membership increased by a mere 3,000 to 10,000, membership fees could be reduced by up to \$20.00. Just imagine how low fees would be if all Australian amateurs were members of the WIA.

When was the last time you signed up a new WIA member?

Equipment Seized by DoTC

A press release from DoTC advises that regulatory officers from DoTC recently co-operated with South Australian police in a raid on "pirate" radiocommunications operators in the Adelaide area.

Scanning receivers, CB radios and modified commercial transceivers were seized in the raid.

DOC 72

The small pamphlet issued by DoTC as DOC 72, and which contains the "Amateur Service - Operating Procedures", was first published in March 1989. An updated version was published in July this year and, with the co-operation of the Department of Transport and Communications and the Australian Government Publishing Service, the latest copy of DOC 72 is included as an insert to this November 1990 issue of Amateur Radio magazine.

This pamphlet, together with DOC 71, which was included as an insert to the October 1990 issue of Amateur Radio magazine, means that all magazine receiving members of the WIA now have a copy of the latest Australian amateur service regulations.

Another service to members from the WIA.

Best Antenna Article

Feedback received from members indicates that they were impressed with the October 1990 "Special Antenna Issue" of Amateur Radio magazine.

The Publications Committee certainly found it interesting because there has been prolonged argument as to which author should receive the prize for the best article published. Part of this decision making difficulty arose when it was pointed out to the Committee that the articles by Bill Rice and Bill Roper

had to be classed as ineligible.

Finally, after much debate, the prize has been awarded to Mr. N. Chivers VK2YO, for his article "160m Helical Vertical". VK2YO receives a free one year membership of the WIA as his prize. Congratulations.

Intruder Watch Log Sheets

Are you an active member of the WIA Intruder Watch team?

The Intruder Watch service, or as it is more generally known overseas, the International Amateur Radio Union

Monitoring Service (IAR-UMS), is a very important function of organised amateur radio in the fight to protect amateur service frequencies.

Monitoring the amateur bands for unauthorised intruders (transmissions emanating from governmental, commercial or military sources), is a time consuming and precise task.

However, if the authorities are to be convinced that intruders are causing harmful interference to the amateur service, then they are not going to be convinced by the occasional report. The WIA Intruder Watch service needs a lot more reports if they are

going to have any success.

Through the co-operation and generosity of Dick Smith Electronics, there is an Intruder Watch log sheet fastened in the centre of this issue of Amateur Radio magazine. Use this form to get yourself started as an Intruder Watcher!

Your monthly reports should be sent to your Divisional Intruder Watch Co-ordinator. You don't know who he is? Contact your Division and find out (see page 3 of this magazine for your Division's telephone number and postal address).

Let us all participate in the ongoing fight to protect OUR frequencies! **ar**

USE IT OR LOSE IT BURGEONING PROBLEMS

MAX STARK VK2CMS BOX 89 KORALEIGH 2735

Pirates on 10m using AM CB channel spacing have been with us for several summers now. Although a good indicator of propagation conditions, it disturbs most of us, particularly those who saw the takeover of 27 MHz and eventual loss of that band.

Peter VK2EVB and Gordon VK4KAL point out in 'AR' June 1990 that the Amateur Service is primary in the 28MHz band. All the more reason to worry about the current Asian invasion for, like a cancer, it will spread. So far, in 'AR' I have seen no authoritative statement on the the equipment or country the clutter emanates from (go on, shoot me down).

Regarding Indonesia, the economy makes unlikely that sort of equipment proliferation. Many people work for \$A10 to \$A15 per week and this can cover little but essentials. I am referring to Bali, but I expect it is the same in Java and Sumatra.

Indonesian licensing is tightly controlled, with no reciprocal rights for visitors. I found only one shop in Denpasar selling amateur radio equipment, and was

told an Indonesian amateur licence was essential to the purchase of transmitting equipment. In Australian dollars the equipment prices were little lower than ours, so there was no advantage in buying gear to take home. There are better things to spend the duty-free allowance on! There are several shops in Denpasar and Kuta selling consumer electronics: organs, stereos, TVs, VCRs, portable radios etc, but any enquiry for CB equipment was difficult to communicate, and finally dismissed with an apologetic shake of the head.

It seems the pirates are running 40Ch AM CB sets both hand-held/mobile and base-station. I believe hand-helds are in there because of poor frequency stability under modulation. This suggests battery operation and/or declining batteries. Some signals are better, with a steady heterodyne and recoverable audio. In none have I detected any Bahasa Indonesian language, which also cancels out Malaysia, as Bahasa Indonesian is derived from Malay. Somebody in a recent 'AR' said the signals emanated from Thailand. This I could believe, because I can't understand

Thai, and I can't understand the pirates. But then again, we know the Khmer Rouge has guns, but what does it do for communications?

Having modified a PLL JV352D from 27 MHz to 28 MHz, I envisage little problem in a manufacturer of CB sets reversing the frequency logic and kicking his production line from 11m to 10m. Someone would probably be able to afford the things. Back to Indonesia. With a basic paypacket of, say RP15,000 per week (RP = Rupiah), and consumer electronics not much cheaper than VK-Land, do you see the population rushing forth to spend RP 130,000 on a chicken bander? (The equivalent of \$A100). A well-spoken waiter in Baris Restaurant in Sanur told me he had to save up RP 50,000 (\$A40) for his wedding ceremony, and he estimated it would take him a year or two to do it!

If you imagine many Indonesians who can afford to be communicators, legally, forget it! Listen on 10m when the Asian invasion is on and see if you can find a heap of YB/YC stations taking advantage of the cycle.

Unfortunately, if Australia

importers do not locate the source of the equipment and get it into the amateur service, some dubious importer will bring it in and sell to the numerous illegal 27MHz operators. Like Peter says, "It's much more tempting for a pirate to use a quiet band than one full of licensed calls."

The offending sets are probably:

- (1) cheap
- (2) freely available
- (e) if obtainable in this country, would promote heaps of legal 10m activity if sold to licensed amateurs. One envisages mobiles and repeaters—the possibilities are there. What about it, Dick?

In conclusion, I ask — can anybody reliably state where the pirates stems from? I don't believe it's Bali!

Footnote: There was no 28MHz AM equipment available in Joko's ham shop in Denpasar, either. 70cm, 2m and HF rigs aplenty. I did find one 27MHz CB OP in Bali, QTH Kuta. A nice guy, proud of his 27MHz base station, proud of his government-issued call sign and proud of his QSL collection!

'FONEFIST' SSB/CW TRANSMITTER FOR 80 METRES

DREW DIAMOND VK3XU
'NAR MEIAN' GATTERS RD
WONGA PARK 3115

Would you like to have a go at building your own transmitter for 80m? For many of us, the main difficulty with such a project would probably be that of obtaining some of the necessary parts. Several overseas publications have recently published details of transmitters and receivers employing ICs which perform a multitude of functions, thereby greatly reducing complexity. Unfortunately for Australian experimenters, many of these devices are simply not economically available (you know the story — "yes, we can get those for you, four to six weeks delivery, \$50 minimum order"). So the scheme does not even get off the ground.

On the other hand, a project made largely from discrete components will be more fully understood, the parts more easily obtained, and any troubleshooting, either during construction or at some later date, will be greatly simplified.

This relatively simple SSB/CW transmitter was made with components purchased from local retail suppliers.

Performance

Modes:	SSB (LSB), CW
Frequency Range:	3.5 to 3.7 MHz
Output Power:	Nominally 2W PEP, 4W CW
Frequency Stability:	Typically less than 20Hz drift in any 10-minute sending period after 30- minute warm-up
Harmonically Related Products:	At least 50 dB down
Non-Harmonically Related Products:	At least 50 dB down
Unwanted Sideband Suppression:	In the order of 35 dB
Carrier Suppression:	At least 35 dB, typically 40 dB
CW Keying Ratio:	In the order of 60 dB (more available)
Supply Voltage:	Nominally 12 to 14 Volts at up to 1A

Output Protection: Will withstand any SWR, including short or open load without damage

Test Equipment Required

High impedance FET voltmeter or DMM, RF probe to suit, general coverage receiver, 50 ohm dummy load/power meter

Circuit Description

Crystal Y1, maintained in oscillation by Q1 supplies 'carrier' at about 4.433 MHz. This signal is applied to the parallel connected gates of balanced mixer Q2-Q3. Amplified audio signal from the microphone is applied to the push/pull connected gates, and the resulting double side-band (DSB) signal is extracted via the balanced tuned circuit connected between the FET drains.

For CW operation, switch S1a is opened, and trimmer capacitor C1 supplies the return path for Y1, which causes the crystal to oscillate at a higher frequency, and so places the 'carrier' inside the pass-band of the crystal filter.

To remove the unwanted lower side-band (the USB passed by the filter becomes inverted later by the frequency conversion); the DSB signal is passed through a crystal ladder filter whose pass-band in this application is about 3 kHz, and is determined mainly by the value of coupling capacitors; 27 pF each for the Philips crystals used here. These crystals must be of the same type and make. Other crystal makes will probably require a different value of coupling capacitor. Filter bandwidth is inversely proportional to C (see references 1-4).

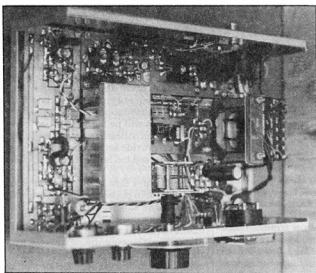
The SSB or CW signal is applied to the parallel connected gates of a second balanced mixer, and VFO signal from the buffered Colpitts oscillator is applied to the push/pull connected gates. To convert the 4.433MHz signal to the 3.5 to 3.7MHz band we must apply VFO at 4.433 + 3.5 to 3.7 MHz, ie 7.933 to 8.133 MHz (in practice, about 7.930 to 8.140 MHz). A broadened balanced tuned circuit at mid-band (about 3.6 MHz) ex-

tracts the wanted signal appearing at the drains of Q4-Q5. The now-unwanted 4.433MHz signal is phased out. Selectivity is such that the unwanted signals (mainly 4.433, 2.567 MHz and VFO) are, at best, only about 40 dB below the wanted signal. This is not satisfactory, even for a low power transmitter, so the mixer is followed by a 3.5 to 3.7MHz band-pass filter which drops the unwanted signals by at least a further 10 dB, but offers little attenuation to the wanted signal.

Our carefully generated milliwatt SSB or CW signal is raised to about 100 mW by broadband amplifier Q6, and raised again by about 14 dB through power MOSFET Q7, a Motorola switcher FET type IRF510. These devices make a cheap, robust amplifier to about 10 MHz at the 5W power level. The drain output impedance is matched to 50 Ohms with 1:4 broadband transformer T2. As significant harmonic energy may exist at the output, this amplifier must be followed by a low-pass filter to reduce these to an acceptable level, in this case -50 dBc.

Problems have been encountered in the past with PA MOSFET heating due to excessive sending drain current, caused by use of an unbalanced gate bias supply. This problem has been solved by sourcing the gate bias from a 6.2V zener supply which renders the standing drain current substantially independent of supply voltage (within reasonable limits), so supply variations between 12 and 14 volts should cause no problem.

To generate a CW signal, the balanced modulator may be deliberately unbalanced, allowing carrier to 'sneak' through this stage. Transistor Q8 pulls one FET source closer to ground potential, upsetting the balance in proportion to 'carrier' pot rotation. The frequency of crystal Y1, as previously mentioned, must be placed nicely inside the SSB filter pass-band. Capacitor C1 is set so that Y1 oscillates at about 4.434 MHz. Voltage to the frequency conversion balanced mixer is ramped up and down by Q11 in response to the key. At key up, no frequency conversion can take place, which results in a respectable keying ratio, and no 'back-wave' will be detectable at the receiving station (if desired, the balanced



modulator may be keyed along with the mixer for a spectacular keying ratio, but with slightly degraded keying waveform characteristic).

Construction

This time I cheated, and bought a ready-made K&W number C1284 box measuring 305 mmW x 200 mmD x 90 mmH. All the boards, including power supply, will fit neatly in the space provided. The great majority of components are accommodated upon the etched side of five home-made double-sided printed wiring boards 'VHF fashion'. No holes are necessary for components (excepting one for the MOSFET heatsink). This project was first breadboarded up on scraps of circuit board, rat's nest fashion, and was debugged successfully in that state. We may assume then, that just about any construction method that you choose you will probably work, provided that signal carrying conductors and by-pass leads are kept as short as practicable.

The power supply (if you do not already have one) may be made first, followed by the VFO, SSB generator, amplifier and control board. The MOSFET drain is connected to the heatsink mounting tag, so don't forget to fit an insulating washer under this screw head.

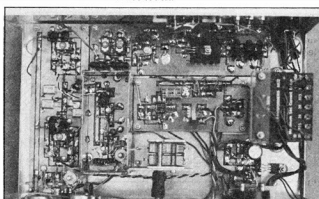
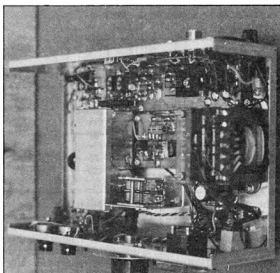
If an internal mains supply is to be included, all mains wiring connections MUST be adequately covered to prevent accidental contact. Both line and neutral conductors must be switched, the mains earth connected to chassis ground, and a 500mA fuse fitted in the line side as shown.

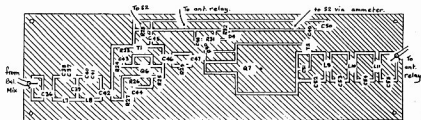
Capacitors used in the VFO tank circuit must be NP0 ceramic, styroseal (or silver mica) where specified. In order to exclude draughts and sudden temperature changes, the VFO should be enclosed in its own box. It may be constructed from double-sided printed board material with all conducting surfaces electrically connected. A small hole will be required each for the 13V supply line, the variable capacitor connection and

twisted pair VFO output. The tight fitting lid may be made of aluminium. To slow down frequency drift due to surrounding heat sources, consider mounting the VFO assembly upon insulated spacers. The ground path may be supplied via a braid to the variable capacitor stator (frame), and a second braid connection to the SSB board.

To minimise frequency wobbles, all VFO tank components must be firmly supported. Later, at the alignment stage when the VFO tuning range has been established—but before dial calibration, VFO tank coil L5 should be cemented with epoxy glue to a small perspex block placed between coil and the wall of the box (see photo).

The MFE131 FETS are rather prone to self-oscillation. To overcome this problem, a "Q-killer" ferrite bead should be fitted to the gate leads where shown. The beads may be held in place with a tiny length of insulation stripped from hook-up wire. Space the beads so that they do not touch.





Component Locations - Driver and PA

39pF would lower it).

Set S2 to "Send". Adjust bias pot R31 so that about 200mA is drawn from the supply. Adjust C1 to mid range. Set S1 to "CW". Listen for the carrier crystal on about 4.433 MHz. If no signal — find out why.

The CW mode also provides the means of lining the thing up. Close the key and see if any output power is indicated as the carrier pot R40 is advanced. If nothing, check with an RF probe at the output of the balanced modulator (L2). Peak C10 for about 0.5V RF. Something should now be showing on the power meter. Peak C20 at about 3.6 MHz. If all is well, about 2 to 5W should be indicated. Also adjust C1 for a peak (i.e. place the carrier at some point of minimum attenuation in the SSB filter pass-band). Adjust C38 and C41 for maximum output consistent with best flatness between 3.5 and 3.7 MHz. These two interact, and some compromise will be necessary.

Now set S1 to SSB and return the carrier pot to min CCW. Whilst listening to the signal on the receiver carefully adjust R7 for a deep null. The power meter should dip to zero. If a good null cannot be obtained reverse L1 coil connections at the drains of Q2-Q3 and try again. At least 35dB carrier suppression should be obtained.

Advance the mic gain pot R44 and

speak into the microphone. PA drain current should flick up to about 300 or 400mA, and about 1W will be indicated on the power meter (remember, the average power for speech is much lower than for CW). Listen to the SSB on your receiver to check that it sounds clean and natural. Also tune around the signal and check for any splatter (you may need to don headphones for this test).

Listen to the unwanted 4.433 MHz signal on CW mode, and adjust R12 for minimum level. It may appear that a deep null is not obtained, but in practice, the signal put to air will be at least 50dB below the wanted signal.

Troubleshooting

Some key DC and RF voltages are shown on the circuit as an aid to troubleshooting should this be necessary (the RF probe used here was the standard ARRL circuit from the "Handbook"), and a 10 megohm FET voltmeter or DMM. The values shown were obtained with the Tx delivering 2W CW output into 50 ohms, and those shown around U1 were obtained when "harlow" is spoken into the microphone in SSB mode. A voltage which departs significantly from that shown could indicate the faulty area. If, after unsuccessful attempts, you cannot locate a problem; please write to me about

it, and I shall extend any reasonable amount of help necessary (SASE please).

Operation

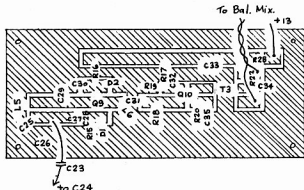
During netting, you may have to advance the "carrier" control a little to produce an audible signal level. Don't forget to return the carrier pot to zero after netting on SSB mode. When sending, it will probably be necessary to turn the RF gain of the receiver down to minimum. Alternatively, if your receiver has a mute line, then it would be desirable to make use of this facility. Perhaps a spare contact set on the antenna relay could do the job.

Parts

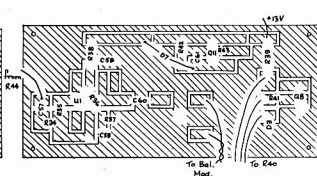
All the parts for this project are available at present. Here in Victoria, there appears to be only two suppliers now handling radio type bits; Stewarts, and Truscotts Electronic World. The variable capacitor, trim capacitors and all the other components were obtained from Truscotts (will also answer mail orders). Stewarts can supply Amidon cores and most components. Other suppliers of Amidon cores also regularly advertise in this journal. Ordinary disceramics may be substituted for "monobloc" capacitors where space is not a problem.

Conclusion

A power of 2W SSB, or 4W CW may seem a very low level to use on 80m. Nevertheless, interstate contacts have been obtained with good readability reports. This transmitter may be regarded as an exciter of quite acceptable signal quality and spectral purity. Later, therefore, a linear amplifier may be added to raise the output power if desired. The development of a 20W MOSFET "afterburner" is already in hand, and it is hoped that details will be presented within the next few months.



Component Locations - VFO



Component Locations - Mic Amp, Keyer, Unbalancer

Parts List For The "Fonefist" SSB/CW Transmitter

Capacitors

18pF NPO ceramic	C23, C31, C39.
22pF " "	C25.
25pF "beehive" air trimmer	C1, C26.
27pF NPO ceramic	C13, C14, C15, C16, C17.
5-55pF compression mica	C10, C20, C38, C40.
100pF air variable	C24.
120pF styrofoam	C11, C21, C36, C42.
220pF " "	C2, C3, C27, C37, C41.
470pF " "	C28, C29.
820pF " "	C52, C55.
1000pF disc ceramic	C56.
1800pF mylar "Greencap"	C53, C54.
0.01µF ceramic or monobloc	C5, C6, C7, C43.
0.1µF monobloc	C4, C8, C9, C12, C18, C19, C22, C30, C32, C33, C34, C35, C44, C45, C46, C47, C48, C49, C51, C57, C60, C61, C63, C64, C65.
10µF tantalum >25V	C58.
100µF electrolytic >25V	C50, C59.
2200µF electrolytic >35V	C62.

Resistors

0.2 ohm 1/2W metal film	R33.
1 ohm 1/8W 5%	R26.
10 ohm 1/8W 5%	R4, R8, R14, R21, R28.
68 ohm " "	R27.
100 ohm " "	R20, R29, R38.
470 ohm " "	R3, R16, R24, R32.
500 ohm miniature trimpot	R7, R12.
1 K ohm 1/8W 5%	R10, R11, R22, R25, R34.
1.5 kohm 1/8W 5%	R9, R30.
3.3 kohm " "	R23.
4.7 kohm " "	R41.
5 kohm miniature trimpot	R31.
10 kohm 1/8W 5%	R13, R43.
20 or 25 kohm lin pot	R40.
22 kohm 1/8W 5%	R2.
33 kohm 1/8W 5%	R36, R37, R42.
47 kohm " "	R1.
68 kohm " "	R5, R19.
100 kohm " "	R15, RR18, R39.
100 kohm log pot	R44.
220 kohm 1/8W 5%	R17, R35.
470 kohm " "	R6.

Semiconductors

MPF102, 2N5457 etc.	Q9.
MFE131, 40673	Q2, Q3, Q4, Q5, Q10.
2N2222, 2N3904 etc.	Q1, Q8.
2N3053, BFY50	Q6.
LF356 8-pin DIL I.C.	U1.
7812 +12V regulator I.C.	U2.
IRF510 MOSFET (motorola)	Q7.
6.2V/400mW zener	D2, D4.
200V/1A diode	D5, D6, D7, D8, D9.
1N914, 1N4148 diode	D1, D3.
LED	D10.

Inductive Components

Amidon T68-2 toroidal core	L1/2, L3/L4, L5, L7, L8, L9, L10, L11 (8).
Amidon FT50-43 toroidal core	T1, T2, T3.
Amidon FB43-101 ferrite bead	For Q2, Q3, Q4, Q5, Q10 (9).
2.2 or 2.5 mH RFC	L6 (DS P/N L1824).
3K to 3K ct transformer	T4 (DS P/N M-0222).
Type 6672 transformer, 30V/1A	T5.

References And Further Reading

1. Hayward, W7ZOI, *Designing and Building Simple Crystal Filters*, QST, July '87.
2. Butler VK5BR, *The Ladder Filter Revisited*, AR Mar, '90.
3. Gurr VK5RG, *Ladder Crystal Filters*, AR Jan, '84.
4. Pivichny N2DCH, *Switchable Bandwidth Crystal Filter*; *Ham Radio* February '90.
5. DeMaw & Collins, *Modern Receiver Mixers for High Dynamic Range*; QST Jan '81.
6. Hayward & DeMaw, *Solid State Design*, ARRL.
7. Method of Making Home Made Circuit Boards, AR Oct '88.
8. Some Practical Tips on VFO Construction, AR Jan '88.

Miscellaneous

4.4336 MHz crystals (e.g. Philips

04042.945) X5, vernier reduction drive, flexible coupler (see text), 1mA/180 ohm meter (most are 180 ohm) or 1A meter, printed circuit material, ANT connector, RX connector, fuse holder, 500mA fuse, power lead, DPDT switch (S1), DPDT centre off switch (S2), knobs, 12V ANT C/O relay, screws, nuts, spacers, #22 and #24 enam wire, hook-up wire, miniature coax, case to suit or material for same, perspex for dial and VFO coil, epoxy glue, 8-pin DIL wire wrap socket for U1, 6030 heatsink for Q7, mic. and key sockets.

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Stolen Equipment

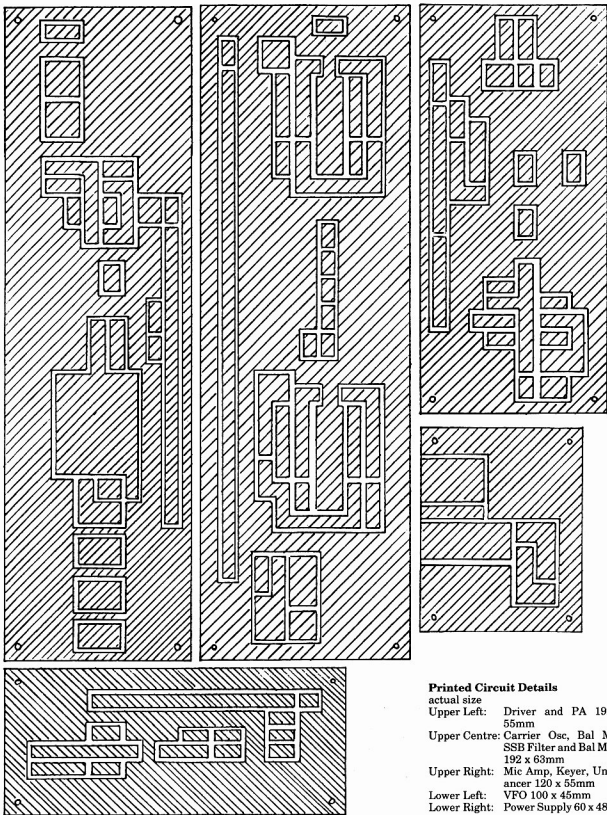
Stolen from the home QTH of Bob Tait VK3BRG on 6/10/90: 1 Yaesu FT 227RA Ser 8L021912. Contact owner or nearest police station.

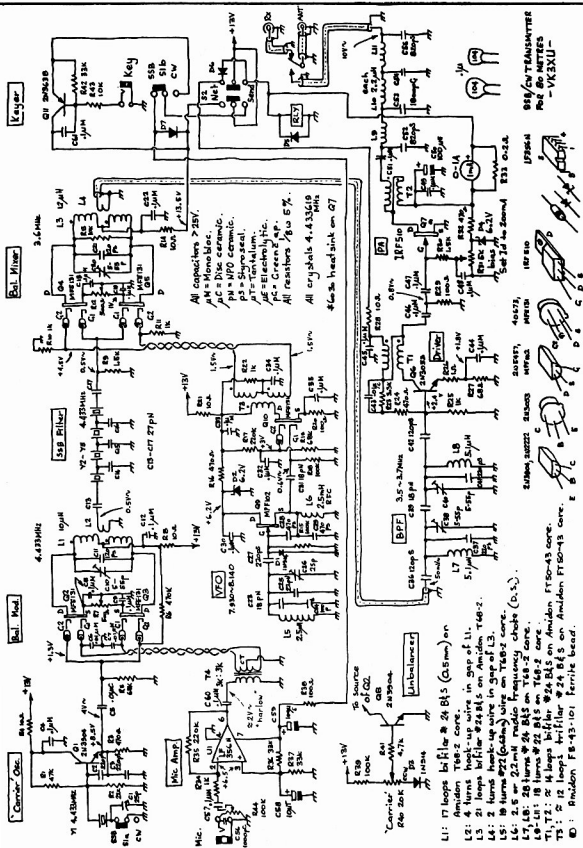
WIA 1990 Novice contest results published in AR October 90 did not mention Eric Pittcock VK4NEF, who scored 680 points in section A.

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The second part of Neville Williams' look at how radiotelephony developed. This month he looks at transmitters using either timed multiple sparks or true electric arcs.

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Back in 1934 was released in the US a true milestone in amateur radio receivers: National's legendary HRO. It set the pattern for many receivers to come, as Peter Lankshear explains.

A FERRITE ROD LOOP AERIAL FOR VLF

LOYD BUTLER VK5BR
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In a previous article (reference 1), I made comparisons between the ferrite rod loop aerial and open frame loop aerials. Experiments were carried out using a ferrite rod 20cm long by 9.5mm diameter and open loops 0.8m square. Generally speaking, the open loop aerials performed with signal sensitivity considerably better than the ferrite rod aerial. However, at frequencies below 100 kHz, I was able to achieve results which were essentially the reverse.

By winding 1540 turns on the ferrite rod in several pies, an inductance of more than 100 millihenries was obtained with the low distributed capacitance of around 50 pF. Using a 15 to 450 pF x 2 gang variable capacitor and a switchable 100 pF fixed capacitor, a tuning range of 11 to 52 kHz was achieved. Higher frequency tuning was made possible by tapping down to junctions between the pies. The large number of turns used at the low frequencies provided a considerable advantage and, below 100 kHz, the signal sensitivity was found to be as much as 10 dB better than an open loop aerial with which it was compared.

More detail on the ferrite rod loop aerial and the comparison open loop is given in the paragraphs which follow.

Detail of the Loops

The ferrite rod was overwound with two pies of 600 turns and one each of 240 turns and 100 turns as shown in figure 1. The pies were wound in a criss-cross pattern to reduce capacitance between individual turns, and this formed a winding shape similar to that shown in the diagram. Machine-wound honeycombed pies would have been better had one of these machines been available.

The diagram (figure 2) shows the loop

switching and tuning circuit and its connection via the interface amplifier. Combined with the two paralleled sections of the tuning gang capacitor, the series connection of all pie windings is tunable between 15.5 and 52 kHz. Tuning is extended down further to 11 kHz by switching in a 1000-pF capacitor across the circuit. Higher frequencies are tuned by switching out one or more of the pies. Q factor of the ferrite loop measured reasonably high at the lower frequencies. At 20 kHz it was 25.

The amplifier is the same as that previously described for VLF-LF loops (reference 2) except that the two resistors at the amplifier input have been increased in value to one megohm. This was necessary because of the higher value of inductance in the ferrite loop aerial, the consequent higher parallel impedance at resonance and the necessity to make the amplifier input resistance high by comparison so that it does not greatly lower the circuit Q.

The open loop aerial, used for comparison, was made up of 20 turns of wire spaced laterally apart by 1cm on a 0.8m square frame. A similar 20-turn loop aerial was described in reference 2, but the shielded wire in this was replaced by a heavier gauge of unshielded wire with 1.1mm diameter conductor. Without shielding, self resonance was increased to 750 kHz as compared to 100 kHz achieved with the shielded wire. This allowed tuning the full range of 10 to 500 kHz without tapping down loop turns. Of course, with only 500 microhenries of

inductance, this loop had been tuned with large values of capacitance switched in as described in reference 2. The heavier gauge wire also increased the Q factor which measured 20 at 20 kHz.

Loop Shielding

One thing that is very noticeable about the ferrite loop aerial at these low frequencies is its high sensitivity to noise pickup from nearby mains cables. This is possibly aggravated by the higher impedance of the loop circuit which makes it more sensitive to electrostatic pickup. Those who have had audio frequency experience with high impedance valve grid circuits, working at low levels, will recognise the need for shielding from the mains leads and other stray noise. The lower VLF extends into the upper audio range and, similarly, electrostatic shielding of the high impedance ferrite loop circuit, including tuning components, is also essential. The loop aerial itself requires a special form of shield which does not act as a short circuit around the loop, restricting magnetic induction into its windings. Figure 3 is a sketch of an open-ended aluminium box which was built as a shield around the aerial under discussion. Observe that one edge of its lid is electrically isolated from the side of the box by insulating spacers.

Even with shielding, the ferrite loop still picks up some noise, and I found it necessary to operate the aerial at least one metre away from any power wiring.

Comparison of Performance

Signal sensitivity (or the ratio of output volts to field strength in volts per metre) for the 20-turn open loop was calculated from the loop formula to be a value of 0.1 at 20 kHz. Signal sensitivity for the ferrite loop was difficult to determine from calculation. Two of the variables in the formula are the corrected permeability and the area (and hence the diameter) of the turns. With the method of winding used, the value of corrected permeability was not clearly defined, and the diameter of turns varied from one centimetre at the centre of a pie to 3.5 cm at the outside. However, using some averaging and a little guesswork, it ap-

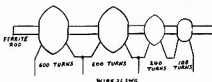


Figure 1 Layout of Ferrite Loop Aerial Windings

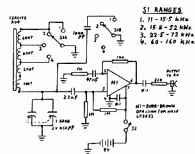


Figure 2 Ferrite Loop Switching, Tuning and Interface Amplifier

peared that, with all windings in circuit, the ferrite loop should be at least equal to, or more sensitive than, the 20-turn open loop. In practice, this proved to be correct, and, at VLF, the ferrite loop was found to have a sensitivity advantage. At 43 kHz, the two loops had much the same sensitivity. At Omega frequencies (around 12 kHz) the ferrite loop produced a signal level about 10 dB greater than the open loop.

Whilst the ferrite loop is quite sensitive at VLF and the lower part of the LF spectrum, its sensitivity falls off as turns are tapped down to enable tuning to higher frequencies. In fact, with only the 100 turn pie in circuit to tune up to 500 kHz, I had great difficulty in detecting the strongest of NDB stations. In consequence, the 100-turn junction was not connected into the loop switching circuit, which is shown in figure 2.

Apart from its higher sensitivity at VLF, the ferrite loop has an advantage over the open frame loop in size and portability. On the other hand, the open loop is less prone to pickup of localised

noise, and I have found that, even if less sensitive, it gives a better signal-to-noise ratio in the presence of such noise.

Conclusions

By using appropriate windings as discussed, the ferrite rod loop aerial can be made to operate with high signal sensitivity in the VLF spectrum. Furthermore, the values of self inductance and capacitance are such that the loop can be tuned over the VLF range of frequencies with an ordinary receiver variable tuning gang capacitor.

Whilst the sample ferrite loop aerial has been found to be more sensitive at VLF than a typical open frame loop aerial, it is inclined to pick up more noise, and its good performance is not maintained above 100 kHz.

In concluding this third article on receiving loop aerials, I must add that these aerials are an interesting field of experimentation which can be carried out with simple materials and minimal cost. Furthermore, they require only limited space and, in fact, operate quite well indoors.

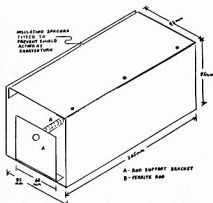


Figure 3 Ferrite Loop Aerial Shield

References

1. Lloyd Butler VK5BR, Receiving Loop Aerials for 1.8 MHz, *Amateur Radio*, September 1990 p10.
2. Lloyd Butler VK5BR, VLF/LF and the Loop Aerial, *Amateur Radio*, August 1990 p12.

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THE COMMODORE C-64 POWER SUPPLY — SOME PROBLEMS AND SYMPTOMS

PETER McADAM VK2EVB
14 GRANT CLOSE COFFS HARBOR 2450

The Commodore C-64 computer has been around for a long time and is still very popular amongst amateurs as a cheap way to get on packet as well as the other digital modes. Something that has become apparent since 24-hour packet operations began is that the C-64 power supplies were not designed for continuous or 100 per cent duty cycle operation. The symptoms arising from this sort of operation in some cases could easily be diagnosed as character ROM failure (U5-2332 or 901225) or VIC chip failure (U19-6567 or 6569) amongst others, even CPU problems (U7-6510 or 8500).

These symptoms are best described by the type of video on the monitor. A screen full of frozen alphanumeric and/or graphics characters, or a sudden complete loss of video and even just system lockup after running for an hour or more could be signs of a power supply fault developing. Usually, if this is the case, the period preceding the symptoms gradually shortens as the days go by until at switch-on the computer fails to perform even the normal systems check. Consequently no video is produced even though the red power on LED is alight.

The actions of the power supply in bringing forward these symptoms are easily explained, namely, expecting a 1-Amp, 5-Volt, 7805 regulator to supply an

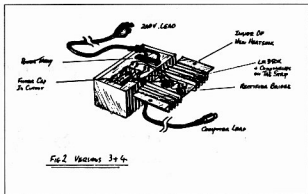
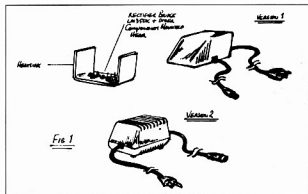
average of 1.5 Amps which, over a long period, amounts to a very hot regulator. While the power supply may be very warm on the outside, the internal regulator is hotter than the tolerance range it was designed for and begins to close down. This drops the voltage below five volts and suddenly the symptoms begin. Once the regulator has been damaged in this way nothing seems to go right. Programs won't load and run properly or, if they do run, after a while they freeze up etc.

The cure seems to be to increase the ampere rating of the regulator and provide more effective cooling. Right about now you will be saying, "How does this bloke expect to do this when the power supply is filled with some sort of epoxy resin to prevent repair, or anything else, for that matter." Well, there are several different types of C-64 power supplies to start with, each with its own peculiarities, even if the circuits are basically the same. To identify the type is reasonably simple and is as follows: oldest type or No 1 = sloping front; No 2 = square with sloping sides and ends with ventilated top and bottom; No 3 = completely box shaped with no vents and ribbed all over; and the newest, No 4 = as number three but with external fuse access. There are varying degrees of difficulty associated with repair of these throw-away design power supplies. The oldest types may not

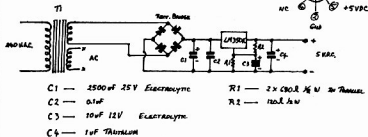
have resin poured over components, but the newer units are filled. With number three version the PCB is not immersed in resin, and by using a desoldering tool it may be completely removed, revealing a standard 3AG fuse on the component side of the PCB (designed for easy replacement by an office-bound expert). On number four, the complete case was filled with resin right to the brim, covering the PCB as well, which doesn't make for easy access. Obviously versions one and two are the easiest to repair, and versions three and four need a good deal of patience but, in the long run, a good heavy duty power supply will result at a much cheaper rate than the special HD supplies offered in the USA.

To begin the operation the bottom must be prised off the case. The base of the later supplies will snap six pillars of plastic to which the base has been glued. It will come off in one piece if you are careful, and will snap back into position when the job is finished. Now whatever you do, don't break the wires off the power transformer. Carefully chip the resin off the board if you have version four so you can desolder the PCB. Once this is achieved you will see that the components are secure in the resin. A mallet and chisel will be needed to make a cavity to fit a larger filter capacitor.

The new supply design calls for an



NEW SUPPLY CIRCUIT FIG. 3



LM350K positive regulator capable of three amperes at between 1.2 and 33 volts which performs well in this circuit. At this point, modifications to versions one and two differ from versions three and four inasmuch as no special heatsink is required for the new regulator is mounted in the existing "U" shaped aluminium cooling fin (see fig 1).

Versions three and four have the regulator mounted on an external finned heatsink (similar to DSE cat:3471) which is screwed to what was the bottom of the old supply. When finished, versions three and four will stand upside down with the heatsink upwards to dissipate heat. On all supplies you will need to mount a full wave bridge rectifier on the heatsink (a 1.8-amp bridge will suffice) to assist it in dissipating heat. Don't forget heatsink compound or paste at this stage. Next the regulator and a five-lug tag strip are mounted on the heatsink, in versions one and two inside the "U" shape, and on versions three and four with the tag strip on the underside (see figs 1 and 2).

In versions three and four, a cavity is cut with mallet and chisel through the components and the resin next to the power transformer, being careful not to damage it in any way. This is needed to hold an electrolytic filter capacitor (25000µF 25V) and allows the heatsink to sit flat on power supply case. The rest of the components in the circuit (fig 3) are soldered in place and the transformer connected. Be careful to wire the 5 VDC and 9 VAC to the computer supply cable with the correct polarities etc (see fig 3). Connect the 240 VAC mains lead to the transformer and, before plugging it into the power point carefully check the circuit is right.

DO NOT CONNECT TO COMPUTER YET! Set up your multimeter to measure

the 5 VDC and switch power on. You should get a reading of about 4.89 to 5.00 Volts. Under **NO CIRCUMSTANCES** connect more than 5 VDC to the computer as **SERIOUS DAMAGE WILL RESULT**. If the DC is okay, then check that the AC output of the transformer is in the range 10.9 to 12 VAC. If all appears okay, a test run on your computer is in order **BUT ONLY AFTER YOU MEASURE THE VOLTAGES** and prove they are correct.

If the DC voltage is incorrect then resistor R1 fig 3 has to be changed. The formula $R1 = (96 \times 5 \text{ volts}) / 120$ is used to calculate the value and the required resistance is 360 ohms. The nearest value easily obtained is 340 ohms by placing two 680 ohm resistors in parallel, which yields 4.89 volts. Testing has shown that the computer happily runs all day on this voltage so the author could not see any further need for experimentation. Now that you are satisfied all is okay and voltages are stable, switch off and reassemble the unit, securing the heatsink to the case (versions three and four require two self-tapping screws to secure the heatsink to the resin). Once again measure voltages to make sure there are no shorts etc caused by reassembly and, if all okay, the new C-64 heavy duty power supply is ready for use.

During constant running the power supply heatsink will become rather warm but the combination of a higher rated regulator and better heatsink will handle the situation excellently. One further thought is to bear in mind that the Commodore C-64 has no protection whatsoever against power surges, transient voltages etc, so please use a surge protector and protect yourself and your computer from complete system failure.

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2 WILTSHIRE DRIVE
SOMERVILLE VIC 3912

I have followed with interest John Sparke's article, "A Can of Worms", June '89, Dr Lucas' comment, p11 October '89, and John Sparke's reflections, p11 August '90. It all confirms my suspicions that the use of that shiny expensive coaxial cable on a large scale by amateurs has clouded their perceptions of setting up a station.

There are three fundamental components. First, an antenna; it can be non-resonant and broad band, a terminated rhombic, resonant, that is an accurately trimmed half or quarter wave, or a random length conductor that must have external L or C added to resonate at the radiated frequency. Next, a connection between the antenna and the power source. This can be: (1) An open single wire, Z_0 around 500 ohms, depending on its diameter. (2) A coaxially shielded wire, air or solid dielectric, usually restricted to the range 35 to 100 ohms. (3) Two parallel wires, mainly air dielectric but, in the case of ribbon lines, the solid dielectric has considerable effect, range 200 to 800 ohms. (4) Four wire lines that can be either two parallel pairs forming a square or the wires can be diagonally connected, the preferred mode for minimum external coupling and radiation, also the lowest noise pick-up. Parallel pairs are easier when switching is required, range 400 to 600 ohms.

We have two options with our transmission line, tune it or terminate it in a non-reactive resistance that exactly equals its Z_0 . This will then appear at the sending end at exactly the same value, a matched line. Tuned lines are a separate subject, the discussion is on 'slightly imperfect' matched lines. The power source, your rig, has within it an active electronic device to convert DC power to RF power. It can be an electronic tube/valve, solid state, a transistor Vfet or next year's wonder from Silicon Valley. I am leaving out negative resistance diodes, Poulsen arcs, Alexanderson alternators and spark transmitters. These devices have one common requirement, for full power output and efficiency they require a value of load resistance within narrow limits, critical for the best linearity.

The figure at the sending end of the line has to be transformed to the load

requirements of the source. Failure to do so results in loss of conversion efficiency. You may achieve the same output power but the source will have higher losses — possibly fatal! The transformation of the antenna resistance to the load line of the RF source includes, in most cases, the addition of a reactive correction at the source. Tune the final! A basic approach with high impedance lines is to place a tuned circuit across the sending end, a second one in the output circuit of the transmitter and arrange mutual coupling of their coils. This allows a smooth adjustment of loading at the source. It works very well at Radio Australia, handling 400 kW PEP! Tuned circuits at 50 ohms require very difficult values so alternative circuitry is used. With untuned broadband amplifiers, suitable transformers are available. When we have a tuned PA this circuit can be utilised as a 'transformer' by 'link coupling'. Make a two or three-turn loop, connect its ends across the coaxial line and poke the loop into the inductance until you have loaded the output stage to the correct value. It is very good for experimenting in an open chassis before fixing it securely in the final position. Beware of volts! There have been many circuits devised to follow simultaneous load and tuning adjustments starting with the Pi Coupler. They will all cover a considerable range by using tapped or multiple coils and switched capacitors to extend the range of the variable C.

The prevalence of linear output stages has, however, forced designers to limit the adjustable range in the output stage to suit 50, maybe 70 ohms loads of negligible reactance. To achieve this load use an antenna peaked at the operating frequency and find a transmission line matching point in the antenna circuit to attach the line to. Failure to meet these requirements produces a 'mismatch'. The result is simple, our line is now a tuned feeder! We can cut the line length for a non-reactive point and hope the resulting R is within the scope of our transmitter output tuning/matching. The alternative is to read up on matching circuits. There is one, hopefully, to suit your case!

Where did I lose 'reflected power' and SWR? A mismatch between antenna and line produces a reflection that, combined

with the incident wave, your signal, produces an interference pattern in the feeder system. When the system is resonated, these signals synchronise and produce a stationary pattern. This can be demonstrated with a probe on a slotted coaxial line and a neon tube or a loop and torch globe on open lines. The SWR meter tells the observer there is an antenna transmission line mismatch.

Now for the difficult bit. What does that 50-ohm sign on the output socket tell the observer? It is simple; your transmitter requires a load of 50 ohms to perform properly! The designer has provided a limited panel control to correct and tune out minor errors so that the PA works into its correct load! Life wasn't meant to be easy, so what can be done to correct some of the 'bugs' that occur? Baluns are great for inter-connecting balanced to unbalanced systems and transforming antenna resistances, but they are usually in a few simple ratios. Take a common case; the folded dipole resonates and you have a 4:1 balun. The output stage will not adjust to the 75 ohms. What now? The rig will probably cope with a 60-ohm load, so use a few resistors and Ohm's Law to satisfy the requirements. Parallel the 300-ohm feeder at the balun terminals with 1200 ohms = 240 ohms which is transformed 4:1 to 60-ohms load for the PA. Dissipation? Well, 1200 will absorb a quarter as much as 300, so it will receive a quarter of one and a quarter = 5/16 or 31 per cent. The drop in signal will be negligible and your PA safer. Should the problem be too low a resistance, very serious for solid-state devices, add a series resistor between the rig and the balun primary or a pair of higher value in series with the feeder lines. Life can be made easier!

Dr Lucas' statement on the use of a matching source resistance is a technique used extensively in laboratory investigations where there is an unknown or variable load. It guarantees the value of the source signal level and resistance, no standing waves occur and your 'downstream' indicators give accurate read-outs. It is an excellent technique for this work but has a minimum loss of 3dB so is not usual in output circuits.

Final over, you match the antenna to the line and load the rig to get power into it.

ar

WE'RE OFF AIR!

DAVID G BARNEVELD VK4BGB
PO Box 275
BOOVAL 4304

For those of us who work in the broadcast industry, these are the magic words that send shock and tremor waves deep into our boots. This story is about a small community public access radio station with which I had the unfortunate task of being chief engineer. For obvious reasons, as you will see, the callsign of the station will remain anonymous.

The scene goes back some eight years ago.

As I recall, I had received a message on my pager to contact the station urgently. It seems the morning announcer had arrived at approximately 6am and proceeded to put his program to line without checking the status of the transmitters. This particular station had no remote control of its transmitters, so they were left running 24 hours a day, even though the station signed off the air at 2400 hours. The announcer had waded through roughly two and a half hours of program, talking into thin air. To paint the picture more clearly, it must be stated here that, being a public broadcast facility, the place was staffed by volunteer helpers who did not have any technical experience. The announcer was listening to the output of the console rather than to the off-air monitor. That's how he got caught.

Upon arrival at the studios, a quick check indicated the transmitter was off, as no carrier was present. Exit stage right. The transmitter hut at this particular station was also built by volunteer labour, and had built-in features such as natural air conditioning through the large gaps between the fibro-cement walls and the roof.

The whole installation was not exactly dust or vermin-proof.

Transmitters

The transmitting equipment involved, as main, a reasonably new 100W AM transmitter. The output device was an Eimac 8873 triode driven by two solid-state Sanken modulators. The standby transmitter was an old AWA 100W with valves bigger than footballs in it. To say the least, this transmitter was an antique. But it worked... somewhat! Upon arrival at the site it was found that the main transmitter had come to a dead stop. Unable to coax any life back into it, I fired up the standby. We were back on

air. Later observations discovered that the main had suffered severe arcing at the PA tube socket and in the vicinity of the output coupling coil. As there had been a storm the night before, it was highly likely that the mast had taken a blow, thereby knocking out the transmitters.

Having no spare parts available, I grabbed the handbook and proceeded to compile a list that would have to be phoned through to Sydney as soon as possible. There was more to come.

Upon arriving back at the studios, I was met with those familiar words once again. "We're off the air." This is the point in time where one dives into his pocket and pulls out a Mintie. Back to the transmitter site once more. Fate had it that the old AWA transmitter was going to that big radio station in the sky this very day. The cause of the shutdown this time was a blown fuse in the PA HT supply. The fuses are located on a drawer at the base of the unit and back somewhat from the front panel. I replaced the fuse and, hey presto, we were back on air. Touch wood!

By now it was after lunch and I was sitting in the workshop organising the rapid delivery of those much needed spare parts for the main transmitter. I had also been joined by a good friend of mine, Mervyn VK4SO, who offered to lend a hand with the problems.

"We're off air" once again rang in my ears at about 5pm.

Both of us headed out to the transmitter site in the failing light, as this was the middle of winter. Same problem as before — blown PA power supply fuse. Looking around the unit, I could not decide what was causing this fuse to keep blowing. There had to be something amiss, but what on earth was it?

Arcing

Having replaced the fuse again, I re-engraved the transmitter and we came up on air. Whilst I stood there talking to Mervyn, the tell-tale sound of something arcing was heard coming from the bottom of the power supply cubicle.

The transmitter was powered down again and the front cover on the power supply removed. Incidentally, this unit had no rear cover. Crouching down on my knees, I slowly gazed through the dust and rubbish that were in the bowels of

this old relic. Not seeing anything, I applied high tension once again. (Interlocks? ... there was none!)

Ah-hah! There it was! A faint glow coming from approximately halfway back inside the cabinet. Grabbing the torch, I shone my way into the innards (after I turned off the power) but could not see the exact area I wanted due to heaps of cable looms and cobwebs which were in the way.

Readjusting my position on the floor, I pushed the wiring loom aside and discovered the arc was being formed across the insulators on the high tension filter choke by a form of conducting medium that was lying across them.

It so happened that the conducting medium was a six-foot carpet snake, still very much alive, and glaring at me in the light of the torch. Well, well, well! The human body is a marvellous thing. You have no idea of the time span between when I saw this snake to the point where my brain had issued orders to my feet to accelerate with full after-burners on.

It would have been measured in nanoseconds!

Somewhat later, having regained my confidence, the snake was removed from the transmitter with a piece of timber. Actually, it was the longest piece of wood I could get my hands on. Harry Butler I am not!

Once again the transmitter was returned to air. I should mention also that the station management was tearing its hair out by this time. They had been on air for less than an hour during the whole day, and were not impressed, to say the least. It was now about 7.30pm and, believe it or not, we were on air. But not for long! The fluorescent lights in the transmitter room, plus the open door, had attracted dozens of flying insects into the building and they were hovering in droves above the top of the transmitter, which had no metal cover plate. Please don't ask me where they dragged this unit in from. The previous owners must have been glad to see it go. Boat anchor material it certainly was! At approximately 8pm the curtain finally fell on the old AWA transmitter. An arc developed in the tank circuit caused by the build-up over the years of dirt and foreign material and this, combined with moths and bugs dropping down into it, turned out to

be the last straw for the poor old girl. The arc had set fire to one of the wiring harnesses, and the damage caused was quite immense.

Off air

Well, what a predicament! At this point I needed a truckload of Minties. Here we were with no transmitters at all. Completely off the air. This is how we stayed for the next two days until the spare parts for the main transmitter arrived from Sydney. I compiled a damage report over the next day or so, and pointed out that the damage to the AWA transmitter was beyond economic repair due to its age, and that a replacement unit should be obtained quickly.

After much duck-shoving and cries of financial doom and gloom, the management decided to give the second-hand market a miss, and accepted my recommendation to purchase a brand new transmitter. The new machine was a "Harris" MW-1A, fully solid state 1k beast. You little beauty! Preparations were then implemented to seal all the cracks and holes out at the transmitter site and make the building a little bit more respectable. Finally, all was complete, even down to industrial carpet tiles on the floor. Shangri-la!

More Minties please! Had I known what was about to happen, I would have ordered another truckload of them. The new transmitter duly arrived and was hoisted into the building with the aid of a forklift. Power, aerial and program lines were then connected to complete the in-

stallation. The machine worked first time around. After doing proof-of-performance checks, I adjusted the power output to 500W and went home happy.

A few days passed and it seemed as though Heaven had dropped in. No problems at all, just the announcer yelling that we were off-air. "Off-air?" Perhaps a power failure at the site? No! Worse to come. The transmitter was dropping in and out quite regularly. Exit stage right once again. The problem this time was not caused by snakes but rather a very high SWR on the antenna. Strange! This problem was not there the other day. Checks around the aerial and the tuning unit showed nothing amiss. To make matters more interesting, the value of reflected power was going up and down like Yogi Berra at random intervals. You could adjust the tuning only to readjust it an hour later. The thought of one of the decoupling capacitors in the tuning unit going faulty was beginning to cross my mind. But, as it turned out, there was nothing wrong with them at all.

The problem was eventually traced to a faulty aerial mast. Apparently, when the station was built, the owners had purloined this mast from an unknown source; just bolted it together and hoped for the best.

Bonding

For those of you not familiar with AM broadcast towers, the general rule is to bond a copper strap from the feed point at the base of the tower and extend it the full height of the mast. This ensures

continuity along the entire length. The copper strap is bonded to the framework at regular intervals along the tower run.

When the tower was erected, this procedure was not followed. What was happening now was that sections of the mast were decoupling themselves. The tower comprised a triangular framework like most AM radiators, which was made up of sections approximately 15ft long. These sections were painted the usual orange and white and bolted together to form the complete mast.

During the night, dew would collect on the tower and flow in between the bolted joints causing a good conductive path. When the sun shone on the tower, it heated up and drove the water out from between the joints. This, together with the sections being bolted together after painting, was causing sections of the mast to insulate themselves from one another, thus causing varying SWR readings.

The problem was overcome by bonding the tower with a two-inch copper strap from top to bottom. No more problems. It would appear that this condition had existed from day one. The other transmitters, having valve final stages, were more tolerant of this condition than was our new toy. Up until the time that I left the station there was no more trouble with the transmitter. That little incident just goes to prove that shortcuts can be your downfall at some later time.

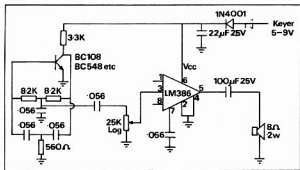
Meanwhile, back at the shack . . . pass the Minties please. 73

ar

TRY THIS Morse Code Oscillator

J A HEATH VK2DVH
12A SOUTH DOWN ROAD
ELDERSLIE CAMDEN 2570

It is claimed that this circuit produces a more pleasing tone than the usual 555 type oscillators.



ar

QSP FROM TURKEY

We have received a letter from four notable Turkish DX operators who were active from Izmir between 1986 and 1989. They are Mustafa TA3B, Umit TA3C, Yasar TA3D and Levent TA3F. They wish to apologise to amateurs around the world who may have sent them QSL cards during these years, but have received no cards in reply.

Briefly, the problem appears to have been an inability by the Turkish Post Office to ensure that all such mail eventually reaches its addressees. The four amateurs suggest that cards should be sent to them by registered mail or, alternatively, via their QSL manager, Thomas Vorkamp DL5YCC, who is QTHR in the current International Callbook.

ar

AMATEUR RADIO IN ARGENTINA

MARCELO FRANCO VK4DWA/LU6DW,
WITH JOE ELLIS VK4AGL
BURNSIDE RD NAMBOUR 4560

There are 30,000 amateur radio operators and 90 radio clubs in Argentina. Almost all of them have their own club premises and radio equipment. There are very few clubs using public institutions for meetings. Those clubs that do not own their building borrow one. Meetings used to be 2 or 3 times a week, after hours during working days, and in the morning during holidays. Individual clubs may differ, but most of them have that scheme. Themes treated at each meeting are not very important, because not all of the members can attend the meetings. Each month there is a full meeting, and important matters about the club are discussed. Most of the clubs have acquired their own buildings by donations but that was some years ago when the Argentine economy was much better than now. Amateur radio in Argentina is considered of interest to the nation. There is not one national association, but two. Neither has the power of the WIA. Actually each club operates within its own region, and the two national associations only try to concentrate these efforts in a common direction. There is only one radio club member of the IARU (region 2). It is the Radio Club Argentina, founded in 1921. This club has the task of running the QSL bureau and amateurs being a member of the club can send and receive cards free of charge and non members have to pay a small charge per card. All the clubs provide courses for getting licences and information on technical matters. It is an obligation for clubs to help non-amateurs get their licences. CW operators are represented by the Argentine CW Group (GACW). It has more than 300 members.

Licences

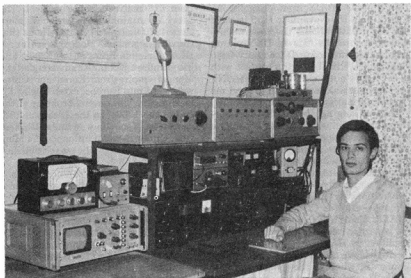
There are four categories.

Novice

12 years old and above. Exam on morsecode, (written only) regulations and technical aspects. 100 W on 80M CW and fone, 40 M CW, 10 M fone, 2m all modes and 70 cm satellite only operation. They have access only to portions of the bands.

Intermediate

16 years old and above, exam on morsecode 5 wpm, regulations and tech-



Marcelo's LU6DW Shack prior to departure for Australia; all home brew except for oscilloscope and Bird wattmeter.

nical aspects. 300 W on all bands on CW plus 80, 40 and 10 M on fone and the whole 50 MHz band.

General

18 years old and above. An amateur can only get this category by upgrading. That means he/she has to be active as novice or intermediate at least one year. Also required is an exam on morse code at 10 wpm, regulations and technical aspects. 1 kW on all bands and modes, except a portion of 15 M and the WARC bands.

Superior

Only after 3 years in general category. Morse code 15 wpm, regulations and technical aspects 1 kW all bands all modes.

The percentages of licences is as follows: novice 57.74%, Intermediate 11.64%, General 12% and Superior 18.62%. Fees to get a licence are moderate, and no fee is required for renewal, which is every five years.

Contests

There are 2 national championships every year, one on phone SSB, and one on

CW. They consist of several contests throughout the year. The WWSA (World Wide South America) CW contest is sponsored by the Argentine CW group every year, during the second weekend of July.

Prefixes

LU and LW are the most common ones. Special prefixes are issued for special events or contests. The call signs do not change with the class of licence. The first letter of the suffix indicates the province.

Bands

All the bands are quite similar to the Australian bands except the 220 MHz band and the 70 cm (430-440 MHz). There is little activity on 160 or 6 metres. Eighty metres is very popular with the novices. 2 metres has a lot of traffic and there are repeaters throughout the country. Bands above 2 metres have little activity but some operators are on satellites and a few 70 cm repeaters. There are several digipeaters and BBS stations.

Equipment

You may find very simple homebrew stations or the most sophisticated equip-

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HUNGARIAN DXPEDITION

STEPHEN PALL VK2PS
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Here is JT0DX, from Mongolia... In the November 1989 issue of "Amateur Radio" there was a small paragraph in the "How's DX" column about the Hungarian DX activity from Mongolia. When I had the contact with JT0DX, the duty operator Dodi HA6NF at the controls, I asked him to send me some information about their expedition.

Not so long ago, a lengthy letter arrived from him which contained quite a lot of information about the expedition, the land and the people of Mongolia and the radio amateur activity in JT. Let me share the contents of the letter with you.

The planning and preparation for the expedition started in January 1989. The group — Andrea (YL) HG1DAL, Gyula HAITJ, Dodi HA6NF and Gyoza HA0MM — was encouraged to undertake the expedition by HAITJ who, in early 1988, visited Ulan Bator, the capital city of Mongolia, when, in the company of four other Hungarian amateurs they helped to establish and build a central amateur radio station for the Mongolian Radio Amateur Association.

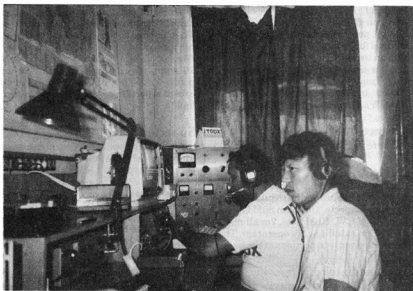
After eight months of planning, letter writing, organising funds for the expedition (the expedition was privately funded by the members themselves) the day of departure arrived on 20 September '89. First stop in their long air journey was Moscow, for 24 hours of sightseeing, then onwards to the Far East. After an eight-hour flight they landed in Ulan Bator on 22 September. Here are a few vital statistics: Mongolia is situated on the continent of Asia, between China to the south and Soviet Siberia to the north. It has a land area of 1,565,000 square kilometres compared with Australia's 7,682,300. The population of Mongolia is 1,820,000. Mongolia is a rugged land. Plateaus and towering mountain ranges cover much of the country. The bleak Gobi Desert blankets much of southeastern Mongolia. Temperatures are usually very hot or very cold. Mongolia's little rainfall occurs in a few summer storms. The country's main economic activity is the raising of livestock. Mongolia is the original home of an Asian people, called Mongols, who built the largest land empire in history during the 1200s. They conquered an area from eastern Asia to eastern Europe. The capital city is Ulan Bator, other towns are Choybalsan, Tsetserleg, Moron, Altay. No part of Mongolia lies less

than 518 metres above sea level. The Altai Mountains in the west rise more than 4270 metres. History tells us that the various groups of Mongols were united under Genghis Khan in the 1200s, and his grandson Kublai Khan extended the Mongol empire from Korea and China westward into Europe, extending as far as Hungary. The empire broke up at the end of the 1300s. In the 18th and 19th centuries, Mongolia was under Chinese rule. Under Russian influence the Mongolian People's Republic was established in 1924.

After this brief geographical and historical detour, back again to the letter of HA6NF. On arrival at the airport, the small Hungarian group was welcomed by various radio amateur officials and, after a typical Mongolian lunch (a variety of dishes of mutton and lamb) they were shown the premises of the Central Amateur Radio Club in Ulan Bator (JT1KAA), which practically became their home during the stay, and they were given all the facilities of the club. Besides the club equipment, they used a Drake TR7 and a Commodore 64 computer with a contest log program developed by HA6NF. This program only needs the operator to log the callsign and the report — the rest of the functions are done automatically. The

antenna used, already in position on the top of the two-storey building, was a five-element tribander (FB53). Finally, the station was on the air, starting an intense 23 days of activity. It took some time before the operators adjusted themselves to the daily "dogpile". They soon changed their operating technique by calling by districts from 1 to 0. This reduced the confusion and enabled a more orderly method of contacts. The first three hours of operation produced 800 QSOs, and they went to bed after being constantly awake for 37 hours (the long journey and the first day's activity). Next day, the group concentrated mainly on the RTTY activity by taking part in the CQ-WW-RTTY Contest. This produced quite a number of contacts, despite a series of mishaps on that day (the balun of the antenna fused, the computer started to have hiccoughs, and a pipe break in the building produced a minor flood; they were up to their ankles in water). Worse was to come: the water got into their display unit, into the computer itself, and finally into their amplifier. It took three and a half hours and solid work by all concerned to get the station back into operation. As time went by, the group refined its operation by having two sta-

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JT0DX Hungarian DXpedition team at work

AMATEUR RADIO IN THE USSR (PART 2)

This is second in a two part series written for the WIA journal, *Amateur Radio magazine*, by Yuri Zolotov UA3HR, a prominent member of the USSR Federation of Radio Sport in Moscow. Yuri is well-known for his work in 1988 when he kept contact with the Soviet-Canadian trans-polar expedition Part 1 was in the August issue.

Licensing In The USSR

Licences are issued for amateur collective (club) stations and to individuals to operate their own amateur station.

Collective stations have three grades or categories of licence while individual stations have four categories. Three of the individual station categories are granted to radio amateurs who have reached 16 years of age, while the 4th category is available from the age of 14.

The right to operate a collective station can be granted even to 12 year olds who have observer call signs.

Licences to operate an amateur radio station in the USSR are issued in two steps. The first includes qualification examinations for electricity and radio engineering, safety, rules of amateur radio communications, and also sending the telegraph code and receiving it by ear. The 4th category needs only an interview without a test in Morse.

Examinations and interviews are arranged by qualification commissions of local radio sports federations of clubs or clubs of the Voluntary Society for Assisting the Armed Forces.

Each category has allocated bands, specific types of communications and maximum transmitter outpower power (see table).

Radio amateurs pay nothing for examinations, formalities and licences. Every shortwave radio amateur pays 3 roubles to his club annually — his membership dues. There are no taxes (licence fees) on radio activities.

Hobby Benefits From Glasnost

The development of glasnost (openness) and democratisation in the country in recent years has brought some changes to the rules of operating amateur stations.

You may have already noticed some Russian stations giving their own address during contacts. A previous ban on contacts with certain countries, such as

Israel, has now been lifted.

And all categories of licence are now allowed to work all DX countries, removing a previous restriction on DX working.

QSL cards can be received at one's home address, ending the long standing ruling that cards had to go only through

the QSL Bureau of the USSR Central Radio Club.

Gear Mostly Homebrew

Soviet radio amateurs are allowed to experiment with such forms of communi-

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Table 1

Frequency bands, permissible outputs and types of communications allowed for Soviet radio stations

Station category	Output W	Band kHz	Type of Communication
4th category individual stations	5	1830-1930	CW
		1860-1930	SSB
		1900-1930	AM
		1830-1930	CW
3rd category individual and collective stations	5	1860-1930	SSB
		1900-1930	AM
		3500-3650	CW
		21000-21150	CW
	10	28000-29700	CW
		28200-29700	SSB
		28800-29200	AM
		VHF bands	
2nd category individual and collective stations	5	1830-1930	CW
		1860-1930	SSB
		1900-1930	AM
		3500-3650	CW
	50	3600-3650	SSB
		7000-7100	CW
		7040-7100	SSB
		14000-14350	CW
	5	21000-21450	CW
		21150-21450	SSB
		28000-29700	CW
		28200-29700	SSB
	5	28800-29200	AM
		VHF bands	
1st category individual and collective stations	10	1830-1930	CW
		1860-1930	SSB
		1900-1930	AM
		3500-3650	CW
	200	3600-3650	SSB
		7000-7100	CW
		7040-7100	SSB
		10100-10150	CW
	5	14000-14350	CW
		14100-14350	SSB
		21000-21450	CW
		21150-21450	SSB
	5	28000-29700	CW
		28200-29700	SSB
		28800-29200	AM
		VHF bands	

VHF bands

144-146 MHz, 430-440 MHz, 1260-1300 MHz, 5650-5670 MHz, 10-10.5 GHz, 47-47.2 GHz, 75.5-76 GHz, 119.98-120.02 GHz, 142-149 GHz and 241-250 GHz.

MOST AMATEURS DEAL WITH THE PROFESSIONALS — *THAT'S US!* AT DICK SMITH ELECTRONICS

2 year warranty FT-212RH MOBILE TRANSCIVER

Enjoy the performance that the latest refinements in microprocessor control have to offer with the FT-212RH 2 metre FM transceiver. With 45 watts output over the 144-148MHz range, a rugged diecast chassis for superb RF isolation, extensive use of surface mount components, and a large back-lit LCD with bargraph PO/S-meter, the FT-212RH is an ideal mobile transceiver that also doubles as an easy to use base station. Operating features include 5 selectable tuning steps, a total of 21 memories (18 general purpose, one CALL-channel, and 2 sub-band limit memories for band scanning), in-built C.T.C.S.S. encode, as well as a variety of scanning functions. The FT-212RH comes with a mobile mounting bracket, convenient MH-14A8 microphone, and DC power lead. Cat D-3494



\$539



2 year warranty

ALL MODE TRANSPORTABLE TRANSCIVERS

The all-mode, transportable transceiver for serious field or mobile operations! The FT-290RII and FT-690RII feature FM, SSB (USB/LSB), and CW operation with 2.5W or 250mW switchable output power, twin VFOs, and 10 memories that store mode and simplex or repeater frequencies. Selectable tuning rates are provided for SSB/CW and FM (SSB- 25/100/2500Hz and 100kHz; FM- 5/10/20kHz and 1MHz), while mode specific features such as a noise blanker and clarifier control for SSB/CW, plus a full set of functions for FM repeater operation make these units very simple to operate. Each unit comes with an FBA-8 battery holder which takes nine C size standard or NiCad batteries (not supplied), antenna, and handheld microphone.

FT-290RII with flexible rubber antenna covers 144-148MHz.

Cat D-2875

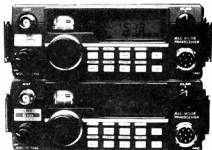
NOW \$749

CLEARANCE PRICE!

FT-690RII with telescopic whip antenna covers 50-54MHz.

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DICK SMITH
ELECTRONICS

Amateur Radio in Argentina continued from page 25

ment. There are some stations having state of the art rigs, but that was more often some time ago. It's very common to find amateur newcomers building AM rigs using valves for 80 metres.

It may sound old fashioned but sometimes that's the only way to get on the air. There are some rigs manufactured in Argentina at low prices.

Amateur radio in Argentina is a very

popular hobby and it will continue as it has done for many years despite the transient economical situation. Packet radio will keep on growing and there may be an increase in activity within the UHF/SHF spectrum.

Footnote

Marcelo Franco migrated to Australia

ar

Hungarian DXpedition continued from page 26

tions operating independently, mainly on phone and CW. However, the RTTY mode was also used quite extensively.

Here are some operational statistics: 32,759 contacts were made. Operation was on 80, 40, 20 15 and 10-metre bands, 12240 CW, 19707 SSB and 812 RTTY contacts. Areas of contacts: Japan 8301, USA 7729, Europe 13,120, others 3609. There were 750 contacts on 80 metres, 2563 on 40 metres, 9921 on 20 metres, 10,964 on 15 metres and 8561 on 10 metres. QSLs direct to HA6KNB, at this address: Radio Club Salgotarjan, Box 115, H-3101, Salgotarjan, Hungary. Please include self-addressed reply airmail envelope and two IRCs. They have started QSLing. Each incoming card will be checked against the computer data and the computer printout will be attached to the cards.

Unfortunately, the Hungarian postal authorities decided to increase the postal rates by 40 per cent as from the

beginning of the year and this causes major problems for the group. If you can afford, send them more than two IRCs.

The Hungarian group, like probably most radio amateurs around the world, knew very little about radio amateur activity inside Mongolia. They were a little surprised to discover the following: the Mongol amateur radio activity is attached to the Mongolian National Defence Association (the same organisational structure applied, or applies still, to many East European amateurs. Every major settlement has an amateur radio club (the 1990 International callbook lists 13 such clubs). About 100 licensed operators are attached to these clubs. Twenty-six individual licences have been issued, the youngest operator being 17 years old (JT1BX) and the oldest 67 years old (JT2AB). Everyone who passes a technical, Morse and regulations test can get a licence. Since March 1989, the radio amateur tests are conducted by a four-member committee (amateurs them-

selves) of the Central Radio Amateur Club of Ulan Bator. The licences then are issued by the secretary of that club. The radio clubs have quite a number of non-licensed members totalling about 1000 — the main activities being orienteering, directional finding and fox-hunting: 600, radio sport: 150, and there are 200 advanced radio sport members (radio sport is a combination of fox-hunting, running, climbing, target-shooting). They have a good tradition of home-brewing. A home-brewing contest is held twice a year. The prominent employee members of the Central Club assist the other clubs by producing technical assistance, back-up and construction services.

After the many hundreds of hours spent at the radio sets, the day of departure arrived and, on 14 October 1989, the four Hungarian amateurs boarded their plane and flew home, still remembering the exciting days of this DXpedition.

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Amateur Radio in the USSR (Part 2) continued from page 27

ications as packet radio, and organise computer-based information networks.

It is a safe bet to say that 99 per cent of all radio amateurs use home-made transmitters or transceivers.

Only a few groups use professional industrial-type radio stations, a poor substitute for amateur sets. As for imported transceivers, there are only a few of them in the country.

It is extremely difficult to buy thin-walled tubes of light alloy metal for making aerials.

This explains the wide use of the double-square (cubical quad) aerials, using wooden poles and wire which are easily available.

Lack of amateur radio equipment hampers radio amateur activities in the schools. School stations are few and far between, although schoolboys of all grades are eager to take up radio as a hobby

Their progress, if any, is due to individual radio amateurs who mainly work in schools on a voluntary basis.

Even so the amateur radio movement is very popular and not confined to amateur communications.

Nationwide exhibitions of home-made radio devices are held regularly, once every two years.

Hundreds of exhibits show amateurs' ingenuity in various fields: radio communications, computer technology, instruments for industry, science, medicine, and agriculture.

A large number of exhibits are designed to help with studies at school, college or university.

Usually there are many domestic radio sets as well as control and measuring instruments. Special juries award the best exhibits diplomas and valuable prizes.

ar

CALLING VIETNAM VETERANS

A net for those associated with the Vietnam War is held on 14.330 +/- QRM at 0000 UTC each Sunday (Monday in VK).

Called the "Nam Net" it's attracting both former Military Affiliate Radio System (MARS) Vietnam Operators and war veterans who are radio amateurs.

MARS handled hundreds of thousands of third-party traffic messages via RTTY and phone-patch between Vietnam and the US. It still provides the link for US service personnel usually on authorised frequencies just outside the 10, 15 and 20-metre bands.

ar

AWARDS

PHILL HARDSTAFF VK3JFE
FEDERAL AWARDS MANAGER

DXCC — Current Status

First up this month a plea for help. When I first took on this job I thought I would be able to handle all the different aspects of this job without too much difficulty. Well I was wrong. The one part that I am finding it hard to keep up with, is the DXCC updates and issuing of certificates. What I need is someone to assist me with or take over the DXCC part of this job, which will enable me to give my full attention to the smooth running of the other awards. Also at the moment, I am trying to get a new award off the ground and this will require a bit more of my time than normal. I need someone who is most likely a keen DXer, and reasonably up with the status of DXCC affairs, who has some spare time he would be willing to contribute. I am still trying to get everything on to computer, but this could be done separately by myself. So don't be put off if you don't have a computer. You will also need a little room to house the current records (at present about 8-10 legal type binders). We can work out the details between us, so if you are interested, give me call on the phone (03) 434 6424 weeknights or weekends) or drop me a line. I will be shifting house some time during the next month but, should still have the same phone no.

DXCC Outstanding Updates

All those who have updates or applications for DXCC not yet dealt with, will be getting a short note very soon confirming the documentation. If you have asked for an update or DXCC itself, and have not got a letter from me by the end of October, (ie by the time you read this) could you please let me know?

Grid Square Award

As I write this on Sunday 7/10/90, I am listening to the VK3 broadcast and have just heard about the delay in the printing of the October issue of AR. I had left the writing of this months notes to the last minute in the hope of getting some feedback from Oct AR regarding the GSA. But alas. This was not to be, so more about the GSA next month.

ZL National Parks Award

I received a small note which apparently came via VK2EHQ, with details of an expedition by a group of Gisborne Amateurs in ZL, who will be operating from a National Park on 9, 10 and 11 November. The actual award requires 2 contacts from stations operating from a National Park. Duplicate contacts are OK on different bands/days, but as there will be a group operating, it should be easy to get

the 2 contacts. No other info was supplied, but I have details from the 1988 Callbook, which says \$2.00 for the award + \$1.00 for airmail to: ZL2GX — Jock White. 152 Lytton Rd, Gisborne, New Zealand

British Post Codes Award

Well, it was our turn last month. This month, from the Civil Service Amateur Radio Society in Britain, comes details of a new award called the British Postcodes Award. This is timed to commemorate the 150th anniversary of the Penny Black, the world's first adhesive postage stamp.

Rules:

1. The award is for working the various UK Postcode areas on or after 6 May 1990, and is issued in three classes: Gold (all 120 Postcode areas); Silver (100 areas); Bronze (75 areas). A contact with a CSARS HQ callsign (G1CSR, G3CSR, G80CSR, GX1CSR or GX3CSR) may be substituted for one unworked Postcode area.
2. General awards in any class can be claimed for any combination of licensed modes and bands (HF, VHF, WARC), but the award can be endorsed for single band, mode etc.
3. Contacts via repeaters or, with stations not operating from a postal address, do not count.
4. QSOs may be made from any one or more postal addresses from which the applicant is permitted to operate using the same callsign.
5. QSLs are not required, and should not be enclosed with applications.
6. Applications should show callsign, name, and full postal address of the applicant, and a list of claimed QSOs showing post-code areas, callsign, date, band, and mode, and certified by the applicant and countersigned by 2 other licensed amateurs, that the claimed QSOs conform with the relevant entries in the applicants log.
7. The award is also available to SWLs on a heard basis.
8. Application together with a fee of \$3.00 or US\$4.00 or 12 IRCs to be sent to the:-
CSARS
Civil Service Recreation Centre
Monek Street
London
SW1P 2BL
England

YL-DXCC Award:

From Gwen Tilson VK3DYL comes details of the YL DXCC Award. The details of which are listed below!

The rules are quite straight forward. As you will not be likely to qualify overnight, I will give a summary here for now. The basic award is for 100 contacts with YLs in 100 different DXCC countries. You must possess cards, but do not need to send them in. A certified list will do instead, signed by a club officer or 2 YL licensed amateurs (exactly why it can only be certified by YLs seems to be a bit unreasonable to me?).

Stations should be listed in the same order as the ARRL countries list. The log must show country worked, date, time, frequency, RS (T) reports and YL's name. There is no charge for the award, but you must include sufficient postage to cover mailing etc. (I would suggest US \$2.00 for air mail.) Upgraded stickers are available for each additional 25 contacts in different countries. Send applications to:

Martha (Marty) Silver, NY4H
New Custodian
3118 Eton Rd,
Raleigh, NC 27608
USA

Closing Thoughts

Well that's about it for this month. I am working my way through a pile of outstanding award applications at the moment, all of which will be mailed by 15/10/90. I will have to leave the details of these awards until next month, as I don't like to list them until they have been mailed. All the best till next time — Phill ar

A Call to all Holders of a Novice Licence

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WIA
PO Box 1066
Parramatta NSW 2124
(109 Wigram Street, Parramatta)
Phone: (02) 689 2417

11am to 2pm Monday to Friday
7 to 9pm Wednesday

CONTESTS

JOHN MARTIN VK3ZJC
MANAGER, ROSS HULL CONTEST

Ross Hull Memorial VHF-UHF Contest 1990-1991

A number of rule changes have been made to the contest this year in an effort to increase its standing as a serious competition for VHF-UHF operators. The most important change has been to adopt scoring based on distance and frequency, rather than by totalling locator squares. The exchange of locators is still encouraged as an aid to distance calculation.

Another change this year is the introduction of separate sections for terrestrial and satellite contacts, allowing both groups to compete in their own areas without being disadvantaged. Anyone may enter for both the terrestrial and satellite sections if desired.

All bands above 50 MHz will be available, with band multipliers to reflect the greater difficulty of making contacts on higher bands. These multipliers are moderate and will guarantee that the contest cannot be won by a small number of contacts on the more "exotic" bands.

Most operators have a favourite band, and many may not have access to more than one or two bands. Awards will be made to the highest scorers on each band, as well as to the winners of the multiband and satellite sections.

The contest will again run during the summer "DX season", to stimulate activity at the time of year when DX contacts are most likely to be made — and when entrants are most likely to have free time.

Over most of its history, the contest has run for a month or more. In the last few years the time has been shorter, but there have still been complaints that even two weeks is too long to be locked away in the shack. On the other hand, a shorter contest would prevent a number of amateurs from participating due to the timing of their Christmas holiday breaks, or other commitments that might clash with the contest. There is also the point that the contest helps to stimulate activity, therefore the longer the better.

This year the contest will run for a longer period, but scores will be based on the entrant's **best seven days** (not necessarily consecutive). This will make it easier for everyone to join in when they can, even if they only have time at weekends. The contest will finish on the weekend before the VHF-UHF Field Day, to provide a break for anyone who wishes to enter both contests.

It is hoped that these new rules will help to increase participation and encourage more amateurs to send in a log. The success of a contest like this cannot of course just be

measured by the number of logs — it is the overall participation and the standard of achievement that count. But under these new rules there should be more incentive for participation, and more opportunity to win an award.

Ross Hull Contest 1990-1991: Rules

The WIA maintains a perpetual trophy in honour of the late Ross Hull and his pioneering achievements in the VHF-UHF field, especially the discovery and investigation of VHF tropospheric propagation.

The name of each year's contest winner is engraved on the trophy, and he/she will receive an attractive wall plaque and certificate. Any licensed amateur can enter this contest — it is **NOT** confined to WIA members.

1. Duration:

0000 UTC Saturday, December 22, 1990 to 2359 UTC Saturday, January 19, 1991. Scoring will be based on the total for the **best seven UTC days** (not necessarily consecutive) nominated by the entrant.

2. Sections:

A. Multiband, terrestrial contacts only.

B. Single band, terrestrial contacts only.

C. Multiband, satellite contacts only.

Entrants for Section A will also be scored for Section B.

Section B entrants may submit logs for more than one band.

Entrants may submit logs for Section C as well as for Sections A/B. The seven UTC days nominated for Section C need not be the same days as those nominated for Sections A/B.

3. General Rules:

All bands above 30 MHz may be used. Single operator only. One contact per band per UTC day. Contacts through repeaters are not permitted. Crossband contacts and satellite contacts are permitted only in Section C. There is no restriction on portable or mobile operation.

4. Contest Exchange:

The exchange will be RS (or RST) numbers plus a two-digit serial number. Serial numbers should begin again at 01 at the start of each UTC day. The exchange of Maidenhead locator numbers is not essential but is encouraged as an aid to distance calculation.

5. Scoring — Sections A/B:

Contacts up to 2000 km: one point per 100 km or part thereof. (ie up to 99 km: 1 point, 100 — 199 km: 2 points, etc).

Contacts over 2000 km: five points per 500 km or part thereof.

Band multipliers:

6m	2m	70 cm	23 cm	13 cm	higher
x1	x3	x5	x7	x10	x15

Examples: 340 km on 2 metres: 12 points.
220 km on 23 cm: 21 points.

6. Scoring — Section C:

Stations may be worked once per mode (see below) per UTC day.

One point per contact. Band multipliers as follows:

- Mode A (145/29): x 3
- Mode B (435/145): x 5
- Mode J (145/435): x 5
- Mode L (1260/435): x 7
- Mode S (435/2401): x 10
- Mode T (21/145): x 3

7. Logs:

Logs should cover the full period of operation, but distance calculations need only be made for the seven chosen days. Separate logs for each band would be helpful, but are not essential. Section C logs must be separate from Section A/B logs.

Logs for Sections A/B must contain the following for each contact:

- UTC date and time.
- Station location.
- Callsign of station worked, band and mode.
- Location or Maidenhead locator of station worked.
- Reports and serial numbers sent and received.
- Estimated distance worked.
- Points claimed.

Logs for Section C should be as above, except that entries in the "band" column would be "Mode A", "Mode J" etc and there is no need to include the other station's location or the estimated distance.

8. Cover sheet:

Logs must be supplied with a cover sheet containing the following:

- Operator's callsign, name and address.
- The location of the station (if different from the postal address).
- Sections entered for A/B and/or C.
- A scoring table set out as the example below (two tables if entering for both the terrestrial and satellite sections).
- A signed declaration that the station has been operated in accordance with the rules and spirit of the contest.

9. Deadline:

Post logs to WIA Ross Hull Contest Manager, PO Box 300, Caulfield South, Vic 3162. Logs must be received by Monday, February 18, 1991.

10. Disqualification:

The normal rules apply. Entrants may be disqualified if there is evidence that claimed contacts were not actually made, or if logs are incomplete or illegible.

11. Awards:

The overall winner of the contest will be the top scorer in Section A. Awards will also be made to the winner of Section C, and to the top scorer on each of the following bands: 6 metres; 2 metres; 70 cm; 23 cm; 13 cm; microwaves (bands above 3 GHz).

Note On Calculating Distances

Absolute accuracy is not needed. It is only necessary to determine whether the distance is above or below the nearest multiple of 100 km. Entrants may estimate distances with a ruler and a map, or quote Maidenhead locator numbers. The contest manager will check claimed distances by computer and if locator numbers are given, the calculation will be made from the centre of the locator square. The contest manager reserves the right to increase or decrease claimed distances on the basis of computer calculation and his decision will be accepted as final.

Sample Scoring Table — Section A/B

Date	6 metres	2 metres	70 cm	23 cm	etc.
Day 1	XXX	XXX	XXX	XXX	
Day 2	XXX	XXX	XXX	XXX	
QSO Total	XXX	XXX	XXX	XXX	
Multiplier		x 1	x 3	x 5	x 7
Band Total	XXX +	XXX +	XXX +	XXX =	XXXXX (finalscore)

A scoring table for Section C would be similar, except that the band headings would be replaced by "Mode A", "Mode B" etc. **ar**

HOW'S DX

STEPHEN PALL VK2PS
PO Box 93 DURAL NSW 2158

Sometimes I wonder, whether "all this" is really worthwhile and is appreciated by the readers and users of this column, and by the actors who create the news of this column: the DX stations themselves.

"All this" simply means the amount of work expended to prepare this monthly column. It means a rigid daily routine. Each day hours are spent in the shack at various times, not so much to operate, but to listen to the activity on the various bands, as a news gathering exercise.

Hours are spent in reading, collecting and collating relevant and irrelevant information from a variety of sources. Beside the use of phone for local, interstate and sometimes overseas calls, there is the ever growing correspondence with all manner of people. With supporters of this column, and they are very much appreciated, with overseas publications, and with the DXers themselves. The DXers are an interesting lot. Most of them are very understanding and co-operative, but a very few of them have to be handled with silk gloves so as not to damage their egos. You also find from time to time interesting letters in the incoming overseas mail; like the two letters recently, both from amateurs from developing countries. One asked for direct assistance to facilitate his immigration to Australia, because he is sick and tired of his old country. The other hinted that we should place an ad in "AR" to assist him to find a local girl whom he can then marry, and thus assist him to migrate to this country!

And of course, there is the dreaded "deadline" towards the end of the month, when all the gathered information is put through a "mental mincer" and the end product is presented to you as the monthly column.

"So what", do I hear you say? "If he cannot stand the heat he should get out of the kitchen..." Yes, that should be the easy part. If I go out of this "hot kitchen", where are the volunteers, the enthusiastic DXers, who will

continue to write this column? Any takers? Do I hear voices or see raised hands?

But there are also a few rare compensating moments. Just as I was contemplating how to put this column together, a letter arrived from a VK amateur. I do not want to embarrass him by publishing his name or callsign, but he writes as follows:

"This is just a note of appreciation for the way in which you conduct the "How's DX?" column in "Amateur Radio". Although I do not work the HF bands, since I live in a flat and antennas are difficult to erect, nonetheless I appreciate hearing the news about various DXpeditions etc around the world. If I cannot work them myself, at least I can read about them. I sincerely hope your work will continue."

Thank you my friend. I will continue the struggle. So now to the news which really matters.

The Seant Convention

The 18th South East Asia Amateur Radio Network (SEANET) convention will be hosted by the Sarawak Branch of the Malaysian Amateur Radio Transmitters Society (MARTS). The convention will be held at the Holiday Inn in Kuching, the capital city of Sarawak from the 10th to the 12th of November 1990. Prominent local and overseas speakers will address the convention which will be attended by the presidents of IARU, MARTS and JARL. Several local state officials as well as local DOC-Telecom and IPS Radio and Space Services Australia will be represented. During the convention the special event station 9M8SEA, Kuching will be active. Immediately at the end of the convention, the adventurous will proceed by air, coach, express boat and finally by long boat to Mt Mulu in a total travel time of ten hours. Here they will visit various famous caves and will operate a special DXpedition station: 9M8ULU. Try to work them both! Good luck and QSL via the

Bureau. Incidentally, SEANET continues to operate on 14320 kHz +/- QRM every evening at 1200 UTC with rostered net control stations (NCS) such as Paddy 4S7PB, Kevin 9M2ZZ, Hassan V85HG, Ben VK6XC and HSH1HV on hand to keep matters running smoothly.

Wallis Islands — FWO

Two New Caledonian amateurs, Sam K8DD and Jean Michel FK8EL were very active in the second part of September as FWO0DD and FWO0ET on several bands both in the SSB and CW mode. QSL with SAE and the usual IRCs to Sam Torone, PO Box 3040 Noumea, New Caledonia.

United Arab Emirates — A6I

Due to the Middle East situation, not many stations are on the band from that area. Saeed A6IAD was working early September at 1416 UTC on 14187 kHz with a good strong signal. His QSL goes to: WB2DND: Donald R Greenbaum, 250 Standish St, Duxbury, MA 02332, USA.

Curacao — PJ

According to various reports, Finland (OH) will send 55 operators and 40 support staff for a multi-multi contest operation for the CQ WW contest, in both SSB and CW modes. The calls will be PJ9W on SSB and PJ9A on CW.

Juan De Nova Island — FR/J

Jacques FR5ZU had various changes in his schedule. Originally he intended to work from Glorioso Island, but that part of the trip was cancelled. However he managed to work from Juan De Nova Island as FR5ZU/J. At the end of September he then proceeded to Europa Island. Whilst these islands, together with Glorioso, belong to the bigger island of Reunion, a French Territory in the Indian Ocean, their special location in the Mozambique Channel between Madagascar and the mainland of Africa, makes Juan De Nova and Glorioso a separate DXCC country. QSL to: J Quillet, 1 Cite de Meteorologie, F-97490 St Clotilde, Reunion Island, France, Indian Ocean.

The Colvins

Iris and Lloyd W6QL and W6KG were in Malawi at the end of September and the beginning of October, working as 7Q7KG. Their final aim is to work from Mozambique (C8-C9) and from Madagascar (5R). QSLs to YASME. (See Oct "AR" for address.)

Isle Of Man — GD

From time to time there is some activity from this UK island. Whilst the callback lists over 300 callsigns, most of them are only VHF operators and only a very few are HF DXers, like GD4PTV Brian, GD4RAG John, and GD4WBY Mike. Stephen Munster G4UOL, Flat 4, 60 Genesta Road, Westcliff-on-Sea, Essex, UK, SS0 8DB, will be on the island between the 17th and 30th November and will operate as GD4UOL, mostly CW.

Tristan Da Cunha Islands — ZD9

Have you heard about these islands? As a DXer you should. What do you know of these islands? Not much? Here is a concentrated description. The islands of Tristan da Cunha, Gough, Inaccessible and Nightingale are a group of British islands in the South Atlantic between South America and southern Africa. The capital is Edinborough, and the group is a dependency of Saint Helena Island. The islands cover 79 sq miles (205 sq kms) and have a population of just under 300. In 1961 a volcano erupted on Tristan da Cunha and the entire population was evacuated to Great Britain. When the island was declared safe, they moved back in 1963.

In the past there were only sporadic operations audible from these remote islands in Australia. The latest was Carol (a YL) ZD9CS. Because of propagation and the fact that the local power supply does not start up before 7 o'clock in the morning local time, it is quite difficult to have a QSO with a ZD9 amateur. A number of net controllers during August and September tried several times to establish a workable QSO pattern without success. A few individuals managed a short contact with her. KB1BE Paul asked me to advise you, that the correct QSL manager for Carol is KA1DE and not Paul KB1BE as advised on the bands previously.

However, one has to be lucky sometimes. On the 28th of September ZD9BV appeared on 14166 at 0719. He came over the North Pole without any preliminary warning at an average signal strength of 5. An enterprising VK4 amateur, Bill VK4UA organised a small list (about 5) of takers. A number of VKs worked him. The operator is Andy, and his QSL manager is W4FRU, John Parrott, PO Box 5127, Suffolk, VA 23435 USA.

You should have heard two days later the long list of amateurs who all wanted to work the ZD9, to capture this rare DX country in their log!

The Woodpecker

For a very long time, this dreadful monster of the early 80s which made life difficult for all amateurs, especially on 20 metres, was silent. One would have thought that, due to the thaw between East and West, the irritating 9 plus broadband pulse signal really had been laid to rest. But what did I hear on the 19th of September at 0740 UTC on 14187 on the longpath towards Europe? Yes, your guess was right. The monster, or one of its relations, has reappeared. Maybe the Persian Gulf situation caused its rebirth. In any case, if you hear it, please report it immediately in writing to your Intruder Watch Coordinator.

Interesting QSOs And QSL Information

Note: Callsign-name-frequency in kHz-mode-UTC-month of the QSO. ADAR= QSL info in previous issues of AR.

*** KJ8M/COH — Rodger — 14020 — CW — 0544 — IOTA NA 67 — QSL to: KJ8M.

Rodger C Phillips, 159E Temperance Road, Temperance, Michigan 48182 USA.

*** 7Q7CW — Rudi — 14022 — CW — 0500. QSL to: DK7PE Rudolf Klos Klein Untergr 25, D-6501, Nieder Ulm, Germany.

*** V73AZ — Dave — 21011 — CW — 2100 — QSL to: N4ASF David M Boulter PO Box 249, Wachapreague, Virginia 23480, USA.

***ZF2PM — 14025 — CW — 0530 — QSL to: NE4L Robin A Gist, RT5 — Box 471, Florence, AL 36560 USA.

*** OY7ML — Martin — 21034 — CW — 0530 — Sept — QSL to: Martin Haasen, PO Box 184, FR-110 Torshavn — Faroe Islands, North Atlantic.

*** ZC4BOB — David — 21205 — SSB — 0519 — Sept — Special event station to celebrate the 50th anniversary of the Battle of Britain. QSL to: Joint Signal Board HQ British Forces Cyprus, BF PO Box 53 London GPO UK.

*** PZ1EL — Ramon — 21205 — SSB — 0605 — Sept — QSL to: Box 9131 Paramaribo Surinam South America.

*** CX1TE — Rafael — 14189 — SSB — 0701 — Sept — QSL to: Rafael Guasp, Box 17, Montevideo, Uruguay, South America.

*** KC6GV — Kaare (one of the main organisers of the Bouvet DXpedition) 14175 — SSB — 1338 — Sept — QSL to: LA2GV: Kaare Pedersen Box 87 N-1580 Rygge, Norway.

*** 8P6OV — Fred — 14222 — SSB — 0643 — Sept — QSL to: Frederick Innis, 33 Harmony Hall, Saint Phillip, Barbados.

*** YJ0AMH — John — 14026 — CW — 0606 — Sept — QSL to: KF7PG: John M Hofstrand Jr 1849 Finn Hall Road Port Angeles, WA 98362.

*** XU8DX — Shokum (YL) 14226 — SSB — 1103 — Sept — QSL to: JA1NUT QSL info ADAR Oct 90.

*** 7J1ADJ/JD1 — Joe — Minami

Torishima — 14226 — SSB — Sept — QSL to: KB1BE Paul R Shafer, 7 Fern Dr Bloomfield CT-06002 USA.

*** XT2BW — Peter — 21205 — SSB — 0542 — Sept — QSL to: WB2YQH Robert E Nadolny, 135 Wetherstone Dr, West Seneca, NY 14224 USA.

*** 3X1SG — Edmond — 1422 — SSB — 0635 — Sept — QSL to: ON6BV, Victor Ravys, Free St 4, B-1590 — Bever — BT — Belgium.

RTTY News

Here is a selection of DX as supplied by Syd, VK2SG.

*** ZD9BV — 21083 at 1940 Z. *** J28TY — 21087 — at 1929Z QSL to Box 2417 Djibouti, Africa. *** YS1RJ — 21089 — at 2100Z. QSL to: Box 792 San Salvador El Salvador, Central America. *** HV3SJ — 14085 at 0156Z QSL to: IODUD. *** ZD8BOB — 21074 — at 2305Z *** A92ET — 21078 — at 1511Z *** 8P9HR — 14086 — at 0131. QSL to: K4BAI *** VQ9RB — 21088 at 1755Z, QSL to: WA4DPW *** 5Z4BI — 21097 — at 2033Z. QSL to: Bill Nesbitt, Box 147 Thika, Kenya, Africa. Incidentally, Syd VK2SG has now applied for the 250 sticker for the ARRL RTTY DXCC.

From Here And There And Everywhere

The ARRL DX Century Club (DXCC) has changed its operations to the "user pays" system. For new members there will be a registration fee of US\$10.00 and further additional charges for other submissions. The DXCC at present is at least 5 months behind with the processing of award applications and is now in the process of changing over to computerised data.

John W2GD will be operating from Aruba as F40GD between November 20th to 27th. He will be active also on the 12 and 17 metres WARC bands. QSL to: N2MM.

If you worked 4X90BS at the beginning of October, then you worked a special event station from the International Stamp Exhibition in Beersheba, Israel.

Ron, ZL1AMO was active from Chatham Island as ZM7AMO until 24th September. As usual, Ron was mostly on the CW section of the bands. QSL to his home address.

If you worked ZL150A in the VK-ZL-Oceania contest, it was a special event station, commemorating the 150th Anniversary of New Zealand. QSL for the SSB contact goes to ZL1AAS, and for the CW contact goes to ZL1AMO.

Many months ago I worked Martin OY7ML on the Faroe Islands. We exchanged the customary QSL cards and a few letters. Some time ago, a heavy packet arrived by seamount from him, with a number of booklets describing the natural beauties and the facilities on this 18 island group situated in the North Atlantic. The origins of the settlement of these

islands go back more than 1000 years to the Viking times. A return package is on its way back to the Faroes with booklets describing VK2 and the life in this country. Martin can be heard frequently when he works his CW friends, VK2QL, VK2DZD and VK6WT.

Steve, 5V7SA (Home call N8HKS) is active again from Togo. After a holiday in the USA, he returned with a complete RTTY station. He was worked at 0636 on 1422 with a good signal of 55. QSL for RTTY contact goes to KB8BS for other contacts to: WB4LFM.

IZ8SGV was a special event station for the celebration of San Gennario's Day. QSL to: IK8IPL.

Sokum (YL) XU8DX is quite active around 1110 to 1200 UTC on various nets. (See Oct 90 "AR") This operation is now acceptable for the DXCC. If you worked C21JM, he is: Jim Motiti, PO Box 421 Republic of Nauru.

There is a new operator in Qatar. He is Ahmed A71CD.

By the time you read this, Bing, VK2BCH is already on his way to Tonga A35, and from there he will proceed to Rotuma.

Harry, VK2RQ (See Oct 90 "AR") was unable to secure accommodation on Christmas Island (VK9 Indian Ocean) therefore the planned DXpedition is now re-scheduled for around March 1991.

There is no further news from the planned Albanian operation. My confidential Hungarian source has not yielded further information. In Eastern Europe the people including amateurs are more interested in the day to day difficulties of living, and I think amateur radio is not the number one priority. An East German, when I asked him what will be his call sign after the 3rd of October (Unification day for the two Germanys) said that the prefix

district numbers will change, otherwise the same call. We will see.

According to Thierry FD1MXH, QSL Mgr for John C53GB, John will be in Zambia next year with a special event station. FD1MXH advises that he is QSL Manager for the following calls: C53GB, TM5M, TM1K, F6BXC/LU, F3CJ/LU and for FF1MKK. By the way, if you worked C53GN, she is the XYL of John.

As many of you know, the Indian QSL Bureau has not been in operation for the past 3 years or more. Now, according to an official letter received by the WIA from the Amateur Radio Society of India (ARSI), there are new appointments to the Indian QSL bureau, and it is functioning again. The address is: ARSI — QSL Service — ARA PO Box 4015 — New Delhi — 11017 — India. Despite this, several Indian amateurs said that the Bureau is still not working, and they want QSLs direct.

The Ile-De-Grosse mini-expedition (see Sept 1990 "AR") had the following call signs active: C10GI (op VE2EBK) VE2EDK/C10GI and VE2DWU/C10GI.

The Bouvet Island DXpeditions logs show an interesting picture. More than 47000 QSOs were made, about 30000 of which were on SSB, 16800 on CW, and only 291 on RTTY. Of the total, 0.8% were in Africa, 0.9% with Oceania, VK, ZL, 3.9% with Central and South America, 15.8% with Asia, 31.3% with Europe, and 47.3% with North America. Of the total, 11.8% were duplicate or "insurance QSOs". This is not a record of which the inconsiderate and selfish "bad boys" of the international amateur fraternity can be proud.

According to "Radio Communication" the official magazine of the RSGB (Aug 90 issue) the call signs SUIEE and SUIEX are "not registered in the licences issued by the Arab

Republic of Egypt".

Interesting QSLs Received

Note: W=weeks, MO=months, YRS=years, FM=from, MGR=manager, OP=operator.

Direct QSLs Received

***KC6AZ (5WFM OP) *** Y06BZL (4MO FM OP) *** C10GI (3W FM OP) *** ZC4DZ (3W FM OP), *** KH8/KK2EKY, 5W1KY, A35KY, ZK3EKY, KH2/VK2EKY all these 2W FM MGR), *** XU8DX (Hungarian operator) (4MO FM MGR), *** 7X4BL (2MO FM OP) *** OX3ZM (1 MO FM OP) *** C53GB (2W FM MGR) *** CN8GJ (3MO FM OP) *** 9X5HG (4W FM OP)

Bureau QSLs received:

UM8MDX (2 YRS), SZ4BH (13MO), 8Q7KH (7 MO), 622WK (13 MO), 622DK (13 MO), JT2AB (20 MO), 4U1TU (12 MO), FY5AN (12 MO), EL2E (18 MO), S79MX (12 MO), 5W1HC (16 MO), ZP5AA (16 MO), HG89HQ (14 MO), HL9TB (14 MO), ZS2RW (15 MO), 3D2AK (15 MO), ZS6P (14 MO), ZB2AZ (13 MO) ZS4AE (14 MO).

Thank You

Your help with information about interesting QSOs — as per format in these columns, or interesting QSL cards received, or any other DX information is always welcome. This month the number of contributors was not at its usual level.

Many thanks for the assistance received from the following: VK2SG, VK2KFU, VK not named contributor, VK4DA, VK4OH, VK5WO, VE2EBK, FD1MXH, Radio Communication, QRZ-DX, and The DX Bulletin.

GOOD DX and 73.

ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST, BRIGHT 3741

Many thanks to Roger VK4YB, who sent me a book called "The Philosophy and Practice of Morse Telegraphy" by T Jarrard Smith and published by Manhattan Electrical Supply Co, Inc. If anyone knows the date that this book might have been printed I would be very interested to know. It features American Morse, sounders only and gravity batteries. As I seem to have been mentioning batteries lately I thought you may be interested in gravity batteries as described in the book.

The Battery.

"One complete set of the constituent parts of a galvanic battery is termed a "cell". All the various parts of a cell are denoted by special names, according to its make up. Although one of the two so-called "elements" entering into the composition of a cell of battery forms,

the Positive Element and the other the Negative Element of said cell, it does not follow that the material composing such element is invariably positive or negative, as the case may be, in any pattern of battery in which it may be found. An element consisting of either lead, iron or copper may be the negative element in a battery of a given construction, and in some other form of battery be the positive element. Its determination depends upon the character of the other element with which it is associated. If the other element consisted of zinc in the above reference, the former would be the case. If of platinum, the latter would be true. The comparative, negative and positive electric qualities of metals have been arranged in the following electromotive rotation:

All metals in this table being, in a single solution, positive towards those that follow,

and consequently negative to those that precede them in the order of mention.

Zinc, cadmium, tin, lead, iron, nickel, bismuth, antimony, copper, silver, gold, platinum, graphite.

It should be borne in mind also that the terms "element" and "pole" are not synonymous. On the contrary, the negative element is invariably the positive pole and Vice Versa. Therefore, to prevent being misunderstood, it is always safest in speaking of any battery element to mention the metal of which it is composed.

Although batteries most frequently contain not only two characters of metal but two mechanically separate solutions, those in general use today in the telegraph service have been reduced to a very simple form called the Gravity Battery.

The positive element of the gravity battery consists of a mass of zinc, variously shaped according to the whim of the manufacturer, with either thin strip copper or lead as the negative element. The solution in which they are commonly immersed, is water in which

both sulphate of copper and sulphate of zinc have been dissolved. Under the action of the current, these two solutions are separated and kept apart by the force of gravity. Hence the name of the battery. The copper solution being heavier falls to the bottom, its limit being defined by its blue colour, while the zinc solution is colourless and remains on top. The dividing line between the two is a jagged margin of weak blue. The dividing line should occur about half way between the two metals. The blue should never touch the zinc. When it does happen, it indicates that the battery is not doing enough work, which can be remedied by "short-circuiting" it for a few hours, or else that too much sulphate of copper is being put into the jar, the remedy for which is to refrain from putting any more in until the blue colour has subsided to the required point. Any excessive fall of the blue colour from the half way line indicates that there is not enough sulphate of copper in the cell, in which event add more, or else that the battery is doing too much work and generating an unwanted

surplus of zinc solution. Whether the latter is the case or not can best be ascertained by the use of a hydrometer.

No trouble will be experienced in managing the gravity battery, if the fact is kept in view that the natural tendency of the battery is to consume sulphate of copper, and create excessive quantities of sulphate of zinc. This explains why sulphate of copper is constantly added, and sulphate of zinc drawn off from time to time."

Back to the code, Morsiacs.

There is another part in this book which I would like to relate to you, and that pertains to the attitude of the student and reads as follows:

"Students should grow up in the art of preserving a tranquil and courteous demeanor in their work on the line. They must be careful to not burden their speeches with ceremony but treat their vis-a-vis with respect. There are circumstances in the peculiarity of telegraphers' work on a wire, dealing with men

they have never seen, that seems sometimes to breed irritation at every dot. The bickering of lawyers at the bar is not a parallel to it, and strange to say in an exceedingly large number of instances in which the operator on the line is pronounced "crank" or "mule", he in personal, individual intercourse is an affable, courteous gentleman, elevated above petty spite and unwilling to wound the sensibilities of even a tramp.

The only good rules to follow in working with nervous, ill-tempered or brutal messengers, are, keep your temper, stick to the text, ignore innuendoes and try calmly to progress your business without attempting to either propitiate or further antagonize your partner on the line, and he will soon become ashamed of himself and special ill treatment on his part toward you at least will cease. These are rules more easily laid down than followed, but their practice yields a big return upon the investment."

73 GIL
ar

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
PO Box 169 MENINGIE 5264

All times are Universal Time Co-ordinated (UTC)

The Beacon List

As is usual for November, only alterations to the beacon list are published, so it seems FO5DR on 50.048 should be added to the list, as Bill Tynan from QST's "The World above 50 MHz" says Bob K6QXY and Joel N6AMG have supplied FO5DR with equipment to initiate a beacon.

Six Metres

From the absence of reports right around the country, it seems everyone is having a rather lean time on six metres. Speaking to Hugh VK5BC, I commented on the reduced frequency of CW calls he was making, and his reply was that as he never received any response, he had reduced the number of calls.

From my establishment at Meningie, the only signals heard have been some momentary backscatter signals, probably from NSW or QLD stations and from VK3OT.

John VK4ZJB reports that, apart from a few weak W and JA stations, the only event of any consequence was a good 5x9 opening to KH6 on 23/9 around 0900.

John also reports receiving his QSL from HH7PV in Haiti (I have a photocopy) for his contact on 3/4/90 at 2132. John said that, as the usual methods did not seem to promote a response, he finally sent a card by registered air mail at a cost of \$8.10 and finally got his confirmation. The address is Patrick de

Verteuil, Abritots, Jeremie, Haiti. This shows that perseverance does eventually bring its reward, and his countries confirmed list now stands at 64. Well done!

While on the subject of QSLs, it should be noted that J86 Okinawa for DXCC purposes is part of Japan and not a separate country. JD1 Minami Torishima and JD1 Ogasawara are listed as separate countries.

From the Japanese CQ Ham Radio magazine for August 1990 (per Graham VK6RO) is a now a late item which may be of interest. From 22/4 to 29/4 JE3TXU operated from Jordan as JY5E and worked IT9LCY, 9H5AB, 9H1CG, FR3EK, Z23JO, 5H1HK, Z55AV, ZS6BMS, V51KC, plus several other calls in some of these areas. In addition beacons heard were V51E, ZS6PW, FR5SIX, ZD8VHF and PY2AMI.

From the same source is a QSL address for CX8BE as Jorge de Castro, PO Box 71, 11000 Montevideo, Uruguay.

Various Comments

During the course of receiving upgradings of the last Six Metres Standings from various amateurs, there were a number of comments appended which may be of general interest. As most would realise, I receive quite a lot of confidential information and comments not for publication or general discussion and this situation is always respected but, in addition, there is often general information which can be conveyed to readers for the benefit of all.

From time to time, I am asked if I have packet or fax to facilitate the exchange of

information. Unfortunately, at this stage I do not, and this is partly due to the severe physical limitations placed on me during the past five years (at the moment I move around using a wheelchair but hopefully this will change in due course). Were it not for the great amount of help given to me by David VK5KK, Keith VK5AKM and Mark VK5AVQ, I would not be on the air, so I need to limit what I ask them to do for me. Maybe later on I will be able to modify my shack to accept some more facilities.

Several people have queried the validity of a few claims of long path contacts and/or hearings of stations via such paths. The observations made include the view that such situations are unlikely to occur at any more than 15 degrees dip latitude of the geomagnetic equator. Does anyone want to start something?

Many readers have commented on the lack of South American and African stations which were worked in Australia. On similar east/west/east paths European stations have had hundreds of contacts into the USA and surrounding countries. Similarly, there have been many contacts between Europe and Africa and North America and South America each over the north/south path similar to our Australia/Japan path. Possibly because it is easier to work the latter type of path, operators in north/south directions tend to look that way more often. There has been no lack of vigilance on the part of Australian operators eager to work South America and Africa. I suppose it needs to be borne in mind that, generally speaking, the distances we need to cover are greater and this may be a contributing factor of more importance than we acknowledge. Whatever the reasons, there is no doubt that from Australia, it is easier to work the Caribbean area than South America.

Geoff VK3AMK included a note which originally came from JA1VOK regarding a modification to the IC-575 noise blander. It involves the addition of an extra 2 to 3 pF across C1 the 1 pF capacitor in the gate of Q1 (2SK192A) in the main unit. Geoff has no other information, but it should not be too hard to make a temporary connection for trial purposes. It would be interesting to hear how the blander performs under severe cross-modulation conditions!

John VK4TL advises that, since the implementation of the 60 km regulation from a Channel 0 translator, six metres is finished for those living in Cairns. John has dismantled his 9 element beam and 36 foot tower and is a very disappointed man, particularly as there is no evidence of any TVI due to 50 MHz operation.

Lyn VK4ALM at Rockhampton, said the vagaries of six metres were very evident this year, with southern stations working long-haul DX, but nothing heard in Rockhampton on many occasions. However, Lyn received much pleasure from working GJ4ICD at 5x9 each way on 12/10/89, then about a week later working a further 13 stations from G land, 5 from France and 2 from Holland all in the space of an hour. Good work but I hope VK5 can soon have a turn!

From The USA

Bill Tynan W3XO/5 from QST's "The World above 50 MHz" reports that JA1VOK, in his August column in "Five Nine" said that VU2AID is expected to be activated again from Madras, India.

Bill also writes that G4UPS advises that the UK6-metre Groups commenced contest will be held concurrently with the SMIRK contest on 17 and 18 November. Whether this will mean

the G stations will spend most of their time looking towards the USA is not known, but last year contacts between Europe and Australia were established around that time.

Some operators in the USA have classified their summer Es period as somewhat poor, but one reads the following from Bill Tynan's columns that on 3/6 Bob WA1OUB worked CT1D7Q and CT4KQ, the latter being worked again on 9/6. On 29/6 the same station worked CT1QP, ZB2EO and ZB2HN. Later the same day he worked EI, two in F, PA, GJ, four in G, two in ON and four Italians. On 30/6 Bob worked ZBOW and ZBOT and on 7/7 CU1EZ and again on 8/7, 11/7 and 22/7. On 18/7 a new country worked was LX1SI. Although the west coast stations mostly shared the contacts, on 11/7 N6CA and K6PVS were both fortunate to work CU2/G3RFS in the Azores Islands which would be a rather rare trans-continental contact from California. The whole affair doesn't appear too bad to me, as the Es distances would be around the 6000 km mark and more!

Steve W2CAP/1 had a memorable day on 26/6 when he worked eight 9H1s, nine in F, six in PA, one CT1, four Italians, five Germans, five Belgians plus OE5NEL and LX1JX thus giving him a new record of more than 100 countries worked. K1JRW also worked DK1PZ and SV1OE for new countries.

A contact of note occurred on 28/6 when G4UPS reported the first contact between San Marino and the USA when T77C worked K4CKS at 2016.

A major objective during the USA summer among N6CA and others is to span the Pacific on one or more microwave bands. N6CA has provided KH6HME with equipment for all bands through to 10 GHz. Despite this year's openings being below par so far, N6CA is hopeful of success. On one occasion, he was

able to hear signals from the 3456 MHz beacon on Mauna Loa from a portable location in the San Diego area. Perhaps these attempts will be of some concern to our present VK record holders.

Help Wanted

During the course of entering into the computer all entries for the Six Metres Standings, I came across a list of 17 stations confirmed which did not bear a call sign. After a lot of study, I thought the list was that of Alf VK4AYX, but he informs me that he has never worked six metres! The submission consisted of VK4ZJB worked on 9/11/80, VK9ZG 10/11/80, JA2HHO 17/11/80, KH6IAA 29/11/80, H44PT 30/11/80, ZL2BGJ 26/12/80, FK8CR 2/1/81, YJ8PD 4/1/81, P29ZFS 10/3/81, DL3MZ/VV5 18/3/81, KG6JDX 6/4/81, WA6BYA 15/4/81, AH8A 20/4/81, FO8DR 22/4/81, YE1GE 23/4/81, VS5LH 24/4/81 and KHOAB 25/4/81. Does anyone recognise these as his contacts? If so, I would be pleased to give them a name and add them to the next list.

Closure

By the time these notes are read, it is to be hoped the spring equinox has produced some exotic DX which has been shared around the country, instead of being so selective, as has often been the case in the past. I would appreciate being advised of your good contacts please.

Closing with two thoughts for the month; "Men may be convinced, but they cannot be pleased, against their will" and "He who believes that the past cannot be changed has not yet written his memoirs."

73 FROM THE VOICE BY THE LAKE.

ar

RANDOM RADIATORS

RON FISHER VK3OM AND
RON COOK VK3AFW

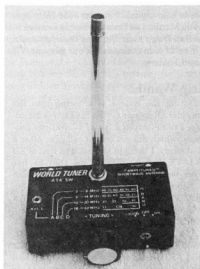
The Editor's comment in the July issue of AR got us thinking. Bill's dissertation on "Old Timers" and the problems they have in getting antennas up. Of course there are two distinct problems here. One is of course the problem of actually getting an antenna into the air due to physical incapacity, but perhaps the second problem of not being actually permitted to put up an antenna is the greatest one to overcome. It seems that many retirement villages for instance are not in favour of outdoor antennas, or for that matter amateur radio at all. Having just helped to move my elderly parents into a retirement village, I made a point of checking on the management's attitude to the inmates participating in hobby activities. Hobbies? Yes they are

definitely encouraged to participate in hobbies to keep active. Well that's great, so you won't mind a few outdoor antennas. Ah, well we might have to look into that one, there could be a few objections to that. I wonder just how many of our members are in a similar position. And I wonder how many might be in this situation in a few years time. What about a retirement village for radio amateurs? Anyhow we thought that a few ideas on hidden indoor antennas might be worth a look at. Don't imagine that indoor antennas are ineffective and worse than useless. For many years, I kept a regular sked with an English friend on 20 metres who used an indoor dipole with excellent results. In fact, over the last ten years, I have worked no less than twenty

"G" stations who were using indoor antennas of one sort or another. This month, we would like to present a few ideas on antennas that can be used either inside or outside where space is limited.

Some Thoughts On Indoor Antennas

Firstly it must be said that any given antenna will usually work better outdoors compared to its performance indoors. But, at the same time, any indoor antenna will work better than no antenna at all. It's better to be on the air than not to be on the air. Some years ago, we did some tests using two mobile whips set up end to end in dipole form. We used a one to one balun to feed the antennas as shown in the photo, and the antenna was then fed with 50 ohm coaxial cable. With this set up, the SWR was around 2:1 over a 25 kHz bandwidth on 40 metres. We pushed the antenna up to a height of about 6 metres on a length of pipe.



We found that it performed quite well. Compared with a full size dipole at something over twice the height, reports from interstate stations were down about 3 "S" points on average, but to counter this to some extent, the short dipole could be rotated to give a small amount of directivity. I am sure that if this antenna was raised to ten or fifteen metres it would have been a very good performer indeed.

Taking this example a stage further, I received an interesting letter from Ed Drying VK2ED, who told of his experiences with a "Shortened Forty Metre Dipole" that was described in the May 1977 issue of AR. This antenna was developed by Ramsay Travena VK3AZX. Over to Ed. "Having very little space, I constructed this antenna and have found it works very well. With the overall length of about 6 metres, it fits into almost any backyard. One advantage is that if a rotation system is available, the antenna can be rotated to take advantage of its lobes. I found it very sharp in tuning, so I made the outer tips a sliding fit with stainless steel clamps and moved the tips until it tuned to

7.0225 MHz (I work CW mostly.) At 7.1 MHz the SWR is about 2:1 but I have an ATU which helps." Thanks for that Ed, and I would think that with a change of coil size this antenna might be equally effective on any other amateur band.

Controlled Feeder Radiation

Radio Communication for May 1990 presented an interesting discussion on controlled feeder radiation by B Sykes G2HCG. We all know why baluns are used in antenna feed systems — or do we. Before getting down to the real purpose of the article, a few quotes from the introduction might be worthwhile. "The use of a balun to feed balanced antennas with coaxial feeder has always been a controversial point, the usual comment being — it works all right without one, so why should I bother. The two vital uses of a balun are to ensure that the polar diagram of the antenna is as planned, and to prevent interference pick-up on the feeder or radiation from it." The point is made that computer hash for instance can be greatly reduced when a coaxial antenna feeder is properly terminated with a balun.

However careful choice of the actual point in which the balun is inserted into the system, produces radiation which will actually improve the operation of the antenna. For instance, it may be that you want to have an omnidirectional radiation pattern or that physical limitations mean the antenna must be erected North-South although you want to work stations to the North and South. This can be achieved by simply moving the balun down the feeder from the antenna feed point by a quarter wave, allowing radiation from the top part of the feeder and using the balun to stop the radiation (and interference pick-up) from the lower part of the feeder.

G2HCG recommends a simple balun, made by passing the coax feeder through a ferrite toroid as shown in fig 1. Since high impedance with a minimum number of turns is required, the use of a high-permeability ferrite core is mandatory. Standard black ferrite cores as used for interference suppression are ideal,

and since the balun may need to be suspended from the antenna, the use of a small coaxial feeder is advantageous in the interests of weight reduction. A 4cm O/D core will take 11 turns of URM 76 cable. A single core is fine for 28 to 14 MHz and two cores taped together for 3.5 and 7 MHz radiation). One point to watch is of course the length of the CFR (Controlled Feeder) feeder section. The length will vary with the design of the choke balun and the example shown in fig 2 results in a CFR section length of 0.275 of a wavelength — 19 feet at 14.2 MHz and this, if added to an existing installation, will not alter the resonant frequency of the system. An idea certainly worth a try.

The World Tuner AT4-SW

We don't intend that reviews of commercial antennas will be a usual feature in this column. However I was so taken with this little device that I thought a mention was worthwhile. It has been around for a couple of years now and in fact I reviewed an early sample on the Radio Australia Communicator Program nearly eighteen months ago. I was so impressed that I bought one straight away and use it regularly. OK, so what is it. It's a receiver active antenna. In its normal state it covers a range from 3 to 30 MHz, but this can be extended down to cover the standard broadcast band if required. A one metre telescopic whip is amplified with a single FET and a BC548 is connected as an emitter follower to drive the receiver. I have used mine with a Sony ICF-7600D and the improvement in performance is nothing short of amazing. I have used this combination all over South East Asia to listen to Radio Australia and of course to also keep a check on the amateur bands. The front end is tuned with a four position band switch and a variable capacitor.

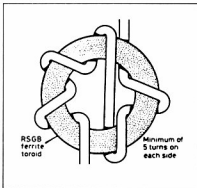


Fig. 1 Method of winding choke balun

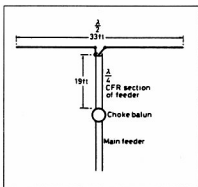
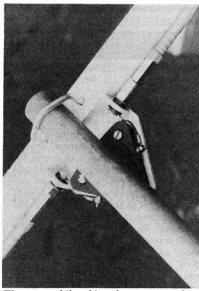


Fig. 2 A 14.2MHz CFR half-wave dipole



The two mobile whips shown mounted with balun

Many active antennas that I have checked over the past few years were very poor due to cross modulation produced by their wide band amplifiers. The World Tuner is sharply tuned

and no cross modulation results. it is even possible to connect a longer wire antenna to improve signal pick-up but in most situations this is not really necessary. The World Tuner

can be purchased either fully built or in kit form from JILLOA Pty Ltd PO Box 73 Glenhunting 3163. For further details, you can phone them on (03) 571 6303. **ar**

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH CO-ORDINATOR
AVIEMORE RUBYVALE 4702

Since my last set of notes, I have received the July issue of "Region 3 News", the journal of the IARU — a very informative little booklet of 50 pages. A quote from Secretary General, Dr Pekka Tarjanne, from his address at the IARU Region 1 Conference, "The ITU has more than an official relationship with the IARU. Amateur radio and radio amateurs are important genes of telecommunications, shaping much of its development and character the world over. Perhaps, the attention of the world has been best captured by amateur radio emergency communications in times of natural disasters. The contribution of radio amateurs to emergency and relief operations is legendary, given sometimes at considerable personal cost and even risk of life. You know that things went fairly well at the last major ITU frequency allocation conference in 1979 for the amateur — the conference in 1992 will have the task of dealing with the 1 to 3 GHz band. A world conference in 1993 will deal again with HF broadcasting matters." I wish I had space to quote the full text, but it is vital to back our WARC rep to the hilt (have you made your donation yet?). It is also vital that all amateurs back the monitoring service to the full in their efforts to "clean out" these illegal intruders from our bands and "pour" so many worthwhile observations into the system, that DOTC will have to really do something more concrete about it — other

Summary For August 1990

Date	Time UTC	Frequency		Callsign	Mode	Logs X	Details Of Traffic If Known And Any Other Information
		In MHz	"M" or "E" If Heard				
220890	1239	3513		J3E			Asian B/caster USB
1208	0115	3526		A3E			Phone call — Australian
1608	1025	3608		"			B/caster music (hrd in WA)
260790	2200	14023.5		F1B	45		24hr/250Hz/3rd Register)
daily	24hrs	14045/6		mni	33		NON/F1B/R7B/SSB/B9W
"	"	14046		"	11		Asian Rad Telephone
"	"	14047.5		F1B	12		RTTY 250 Hz shift
daily	24hrs	14058		A3C	36		Helschreiber Fax Poss China
"	daily	14074.5VRQ		A1A	47		Often VBX on freq also
mni	mni	14119 QRJ??		F1B	6		RTTY 1000Hz shift
daily	daily	14141 UMS		mni	36		24hr/Naval Radio Moscow
"	"	14171 UMS		F1B	24		18hrs/RTTY 250Hz/75b
		14211.5					" 7 12hrs on air
270790	0940+	14215 RKR		A1A	5		Also RTTY/HO? uses same freq
1508	1000+	14217		F1B	8		12hrs/RTTY 250 Hz shift
2507	0935	14222/5		2xR7B	12		24hrs/100% occupancy of freq
2607	1206+	21032/3 UMS		F1B	5		75b/250Hz USSR Moscow Naval
2408	0900+	21113/5 CQ5		A1A	25		Also FQ5traffic in/out
daily	mni	21123 XW4		"	8		Mny calls Rec Tf/o a new one
1308	0600+	28094.8		A3E			B/cast Possibly Indian (WA)
290890	0242+	28515		"	5		B/cast for talks & music
1108	0906	28575		"	13		as above
mni	mni	28575		A3E			USR B/cast talk in Russian
2308	0900+	28980					

Logs by VKs 3XB, 4BG, 4AKX, 4BHH, 4BTW, 4BXC, 4CAS, 4EKA, 4KHQ, 5GZ, 6AF, 6BEK, 6RO & 6XW, my thanks once again. This is an abridged summary 73 VK4KAL.
Late report — Robin VK7RH. **ar**

EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445 BLACKBURN 3130

Once again I have just been through the trauma of moving house, so have not been able to give a lot of attention to radio and education for a little while. However, I am hoping, and intending, that this move will be the last for a considerable period, so please insert the above address in your new callbook when you buy it.

I am also looking forward to finding and/or re-discovering a number of items which were not unpacked after the last move. I am now in a position where I should be able to get some decent antennas up, and use the gear for more than just keeping in touch with the family.

I do not recall ever having used this column

to publicise the benefits of multiple licensing within a family or group, but I have always advocated the encouragement of more YLs into the hobby. Recent Callbook listings show that there are now many multi-operator households, but the percentage of female licensees is still not high. Discrimination?! Equal Rights! Affirmative action!

It is still fairly universally accepted that amateurs are male, that if the amateur is married, the wife is "anti-radio", and that the "shack" is out of bounds and preferably out of the house. This attitude perpetuates a sad neglect of a significant potential source of recruits, and contributes to tension within

the household.

Some of the benefits of multiple licences will be apparent to all who have used CB to say they will be late home, or to call home to check for information, but I would particularly mention the value of having two members of a household attending classes together. The extra time that can be spent in discussion, the slightly differing information that each collects, and the experience of trying to explain a poorly grasped point to someone else are all valuable aids to the understanding needed for the final examination.

However, let us not neglect the ladies who wish or may need to tackle the exam on their own. Let me make it quite clear that there is no inherent reason why the exam should be more daunting for ladies than for gents. Most candidates will have to put in a significant effort — some more than others depending on education and employment background.

Summary for August 1990 cont.

Date	Frequency		Call sign	Mode	Logs X	Details Of Traffic If Known And Any Other Information
	Time UTC	In MHz "M" or "E" If Heard				
2408	0900+	21032/3	UMS	F1B	5	75bd/250Hz USSR Moscow Naval
daily	mni	21113/5	CQ5	A1A	25	Also FQ5 traffic in/out
1308	0600+	21123	XW4	"	8	Mny calls Rec Tfo/a new one
290890	0242+	28094.8		A3E		B/cast Possibly Indian (WA)
1108	0906	28515		"	5	B/cast for, talks & music
mni	mni	28575		"	13	as above
2308	0900+	28980		A3E		USR B/cast talk in Russian

Logs by VKs 3XB, 4BG, 4AKX, 4BHJ, 4BTW, 4BXC, 4CAS, 4EKA, 4KHQ, 5GZ, 6AF, 6BEK, 6RO & 6XW, my thanks once again. This is an abridged summary 73 VK4KAL.
Late report — Robin VK7RH.

ar

**Prevent
Pirates**
Make sure you
sell your
transmitter to a
licensed amateur

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

As I am writing this, the tense situation in the Gulf Crisis has now shown signs of easing. The propaganda battle continues over the airwaves, and it is apparent that many people within the region are relying on shortwave radio to provide them with updated news on developments within the region and beyond. This has been a shot in the arm to many international broadcasters, who were facing a bleak budgetary future. The prominence of shortwave broadcasting has been now recognized by many administrations, who are believed to be re-assessing the financial and strategic needs of the stations.

Many of the hostages, who either escaped or were freed from their detention, have told that they relied totally on shortwave for news on what was going on and for news from home. Many stations broadcasting to the Middle East introduced segments where relatives could send messages and greeting to their loved ones either trapped in the Gulf, or serving with the multi-national forces in the region.

In last month's column, I mentioned the possibility that the Iraqis had destroyed the R Kuwait senders. Late in August, the transmitters sprang back into life, this time carry-

ing R Bagdad's output. They are utilising the R Kuwait frequencies, and I am hearing them on 15495 kHz from 0400 UTC. You can also hear Bagdad in Arabic at the very top of the 22 metre allocation on 13800 kHz in parallel at good levels. Incidentally, monitors have noted that the English output from Bagdad from 2000 to 2155 UTC has been changing between 13600 and 13660 kHz. It seems to be at the whim of the technicians or perhaps an engineering fault.

Reports in the DX press indicate that Radio Berlin International will cease broadcasting on the 3rd of October and Deutsche Welle will acquire the senders in East Germany. As previously mentioned in this column, the presenters at RBI made plain their displeasure at this development in their programming. So the German Democratic Republic is no more and is now therefore a deleted country. Berlin is going to be the Capital of a united Germany.

I came across Radio Tashkent the other day, after a long absence. When I commenced as a SWL in the late fifties and early sixties, I used to tune to this station regularly, as its programming was different from that of Radio Moscow. Yet now I find it sounds very similar

to the output Radio Moscow had pre-glasnost. I expect change moves slowly from Moscow. Judge for yourself on 17740 kHz at 1200 UTC in English, and it is on other channels as well at the same time.

Incidentally, as I am now operational on packet, you can now leave information there for me as follows: VK7RH@VK7BBS.

There is quite a deal of information on SWL loggings on your packet BBS now, and I am occasionally contributing updated information there as well as VK2XY and friends.

Belgium is a small nation in western Europe and has played a significant role in 20th Century history. Yet many outsiders are unaware that this country has been divided linguistically between Dutch and French. This has caused frictions which have spilled over into the political arena. The French speaking community known as the Walloons are in the south close to the French border and resent the more powerful Flemish community. Some Walloons would like to be part of a greater France. Belgium has two separate organizations for international broadcasting, one Flemish and the other French, although they utilize the same senders. You can hear the Flemish BRT in English at 1230 UTC on 21810 kHz and the French RTBF on 21.460 kHz at 0700 UTC. Incidentally, the future of RTBF is in doubt, as they are reportedly inhibited by budgetary cutbacks.

Well that is all for this month, until next time the very best of DX and 73 DE VK7RH.

ar

FTAC NEWS

JOHN MARTIN VK3ZJC
FTAC CHAIRMAN

Feedback

Comments would be appreciated on the proposed new plans published last month for the 2.3 GHz and higher bands.

New VHF Records

Steve Hutcheon VK4ZSH and Ed Penikis

VK1VP have set two new VK1 records — 104.7 km on 1296 MHz, and 6.8 km on 5.7 GHz. A report has just been received of a 6 metre contact between Rex VK8RH and an 8R1 station, which will almost certainly be a new national record.

ar

How's DX?

Unhappily, we report the sudden sickness and admission to hospital of Stephen Pall, VK2PS, our hard-working DX Editor. We hope he has a swift recovery, and a prompt return to writing his popular column.

ALARA

JOY COLLIS VK2EBX
PO Box 22 YEoval 2868

ALARAMEET 1990

What a fabulous weekend! Even the weather was on its best behaviour for us to help make the Dubbo ALARAMEET, held on 29/30th September, an outstanding success.

It really started with an "icebreaker" dinner on Friday night, (not, of course, that there was very much ice to be broken). By 6.45 vehicles flying the black and gold ribbons were arriving at the Westside Hotel/Motel, and another group were walking from the nearby caravan park. (We will not talk about the YL who drove twice around the roundabout before she found the place, will we!) The meal was most enjoyable, and of course, there was as much talking as there was eating.

I have been informed by a "reliable source" that social visiting at the caravan park after everyone eventually got back there went on until a late hour, as it did for the whole weekend. It is unlikely that anyone managed to get to bed very early.

We arrived at our meeting venue, the Orana Education Centre, at 9.00 o'clock on Saturday morning to be greeted by Jenny VK5ANW (President) and Maria VK5BMT (ALARAMEET Co-ordinator), and collected our name tags before going in for tea/coffee and bikkies. The name tags were most impressive. Designed and made by Dale and Nancy VK2NPG they were small wooden maps of Australia featuring name and callsign, the words "ALARAMEET SEPT 1990", and the NSW border enclosing the word "DUBBO".

"Our" room was beautifully decorated with balloons and paper streamers in the ALARA colours of black and gold, and the ALARA banner was prominently displayed.

Proceedings began at 9.30 with the opening address from Jenny VK5ANW, followed by three presentations:

Marilyn VK3DMS was presented with a Meritorious Service Plaque in recognition of her many services to ALARA over the years; Maria VK5BMT received a bag of gold coins for her work in arranging and organising the ALARAMEET so efficiently; I was somewhat surprised to receive an ALARA sweater for assisting, (in a small way,) as "Jilly on the spot."

There was plenty of time to catch up with "old" friends, and put "new" faces to voices, ALL signals 5/9+. Lunch was served at 12 noon, after which we assembled to convoy out to the Western Plains Zoo, yours truly and OM being in the lead car because we were supposed to know our way around it. I think the worthy citizens of Dubbo were not quite sure what had invaded their fair town, as the cavalcade of cars sporting black and gold ribbons moved in slow and stately procession along the road leading to the zoo. We drove one circuit of the zoo, (well, there was only one road that went right around it, so even I couldn't get lost) then split up to go and make the acquaintance of whatever animals took our fancy, a very pleasant way to spend a warm, sunny afternoon. Not that any of us were anxious to get too acquainted with the Bengal tigers!

At 6.00 pm we reassembled for a delicious catered meal in "our" room, followed by a social evening, and no shortage of conversation, doubtless helped along by the pink champagne generously donated by Wolf Blass of South Australia.

During the evening Meg VK5AOV presented some rather special awards:

To Poppy VK6YF for suggesting the use of the black and gold ribbons, and for flying them in Dubbo three days early; to Anne VK4ANN for being so enthusiastic she arrived twelve hours ahead of her OM; Jenny VK5ANW for navigation — coming to Dubbo via Narrandera and Janet VK5NEI who was driving — for being so easily led astray; Maria VK5BMT for reminding us to make sure we had all our badges, and forgetting her own; Pat VK4PT and OM Ted — operating marine mobile on the road between Wyalong and Forbes; myself for arriving half-an-hour early for Friday night's meal (Dan claimed half of that one!) and Anne ZL2BOV who could not remember the name of her motel.

A tour of Old Dubbo Gaol had been arranged for Sunday morning, which proved interesting. Luckily nobody managed to lock themselves in a cell!

We assembled at our venue at 12 noon for chicken lunch and "closing ceremonies". Unfortunately Madam President was unable to officiate because she had lost her voice. (I



Barry VK7GE long-time controller of the 222 YL Net and DX visitor Zdena OK2BBI

wonder why?) Maria VK5BMT, who still had some voice left, took her place. Val VK4VR and Anne VK4ANN presented everyone present with a beautifully made coaster and bookmark as a souvenir. These were enthusiastically received.

The special effort was drawn, results being:
1st prize: Aimee FK8FA. ("Puss-in-Boots" donated by Marilyn VK3DMS.)

2nd prize: Aimee FK8FA. (Crocheted cushions donated by Maria VK5BMT.)

3rd prize: Christine VK5CTY. (Painting donated by Pat VK4PT.)

After lunch VK2EBX and VK4ANN were called upon to take down the ALARA banner, which was then handed to Margaret VK3DMS who will co-ordinate the next ALARAMEET in 1993 at Castlemaine, Victoria.

Our thanks to everyone involved in making ALARAMEET 1990 such an enjoyable and memorable occasion, and particularly to Maria VK5BMT, whose efficient and careful organisation ensured that everything went without a hitch.

ALARA Contest

We would like to remind you that the 24 hour ALARA Contest will be held on Saturday 10th November. (UTC). Please try and get on air, even if only for a short time. All licensed amateur radio operators and short-wave listeners are invited to participate, and this is also a good opportunity to pick up points for the attractive ALARA Award.

Bonnie VK3BBL

This month's front cover features Bonnie VK3BBL, a member of ALARA since 1983. Bonnie first became interested in amateur radio while travelling outback Australia with a group including Arthur VK3BII. Arthur



Sally VK4MDG

encouraged her to study, and she attained her novice licence in 1981 with the callsign VK3PBL, upgrading in 1989.

She has travelled around and across Australia over 17 years, crossing almost every desert. One of her most interesting trips was along the Canning Stock Route, approximately 2000 kilometres between Wiluna and Halls Creek, Western Australia. Bonnie has found the Travellers' Net invaluable while travelling through isolated places.

No one else in her family is interested in amateur radio, but she is hoping one day she may be able to recruit her grandchildren.

Another of Bonnie's interests is family tree research, and she has come across some very interesting ancestors while tracing her family history, including three convicts, a bushranger and the first settler in the Goulburn district.

Those Birds Again!

Regarding birds versus aerals, I have received a very helpful letter from Al VK3PA

together with diagram, and further information on the idea of using fishing line in the aerial system. Al says: "Place fishing line 1-2" above the elements of the beam. Use TV cable feed insulators with wrap around element of stand-off for fishing line. Place two lines along boom in the same way, then look, no more birds!"

Al also suggests an idea for saving notepad paper — "Use the kids Magic Notepads, the ones with clear plastic page you write on, and just lift the page when full."

Thank you for these ideas Al, and thanks to all who have genuinely attempted to solve the rather vexing problem of birds and aerals. (This excludes some of the rather facetious solutions we have been given!)

New Members, Changes Of Callsign Etc.

Welcome to ALARA to new members; Shelley VK6NSB, Esther N5NHV, Sharon KB6VCR and Pam VK3EYL.

Congratulations to Phyl VK3KYL (Ex:

VK3PYL.)

The "is my face red" department:

Jo-Anne is VK4JO (formerly VK4CYL). This is, of course, not an upgrade but a change of callsign. The same applies to Marlene VK3WQ (Ex: VK3FML).

Best wishes to Ivor, (husband of Mavis VK3KS.) who is recovering from illness.

This will probably be the last time I write the ALARA column, as health problems have necessitated my relinquishing the position of publicity officer.

I have thoroughly enjoyed this occupation during the last five years, and would like to thank the WIA and editorial staff of "Amateur Radio" for always making space for our column, and also everyone who has sent in articles, notes, comments and photographs without which it would have been very difficult at times.

I am sure you will all give my successor the same sort of support you have given me, and that she will have as much pleasure writing the column as I have had. **ar**

AMSAT AUSTRALIA

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON SA 5074

National Coordinator
Graham Ratcliff VK5AGR

Packet Address:
VK5AGR @ VK5WI
Information Nets
AMSAT Australia
Control: VK5AGR

Amateur check in: 0945 UTC
Sunday Bulletin commences: 1000 UTC
Primary frequency: 3.685 MHz
Secondary frequency: 7.064 MHz

(7.064 MHz is the frequency presently in use)

AMSAT SW PACIFIC 2200 UTC Saturday, 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional Broadcasts.

AMSAT Australia Newsletter And Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has over 310 subscribers. Should you also wish to subscribe, send a cheque for \$20 payable to AMSAT Australia addressed as follows:

AMSAT Australia, GPO Box 2141, Adelaide 5001.

The newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur

satellites. Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of \$10 per item to AMSAT Australia together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services send a SASE to Graham.

FO-20 Update And Schedule

(From AMSAT News Service Bulletin 272.01, September 29, 1990)

Latest Japanese Bird Still Experiencing Temperature Problems

The FO-20 Command Team at JARL report that FO-20 is continuing to experience high temperature problems which is forcing a drastic reduction of operations on the bird. Unfortunately, because FO-20 is currently experiencing a period of eclipse-free orbits, the natural cooling off of the satellite during eclipse is not occurring. Therefore, the reduction of transponder operation availability is one way to reduce the internal temperature build up. As of the weekend of 29 Sept 90, the battery temperature had risen to near 45 degrees C. Extended exposure to high battery temperature will decrease the useful life of the battery.

Although subject to change at any moment, this list is the current schedule of operation for FO-20:

From	To	Mode
01 Oct 90 0900	02 Oct 90 0910	PSK Telemetry acquisition

04 Oct 90 0955	04 Oct 90 2330	JA
08 Oct 90 0920	08 Oct 90 1110	JA and JD
11 Oct 90 0825	12 Oct 90 0850	JD

The above dates and time are in UTC.

The FO-20 Command Team will be monitoring satellite performance and operations during these times and may turn off the transponder if they determine that the satellite is in danger.

Subject: Packet/Voice Experiment On MIR

(From AMSAT News Service Bulletin 272.02 September 29, 1990).

New 2 m Packet/Voice Equipment to Fly on Mir Space Station In January '91

A new and exciting amateur radio project is being planned for the Mir space station known as the "Amateur Radio Experiment on Mir" or AREM. This project is the result of a collaboration between hams in the Soviet Union and the Austrian Amateur Radio Society (OEVSV). This project is designed to provide equipment for both 2 m packet data and voice transmissions from Mir. The voice messages from Mir will provide timely information to radio amateurs while being another educational tool to help school teachers start students thinking about space science. The voice messages will be spoken in German, Russian, and English. The voice beacons will alternate with packet transmissions.

The basic AREM station will consist of a 2m transceiver, a lap-top computer, a TNC-2 running at 1200 baud and using AX.25 protocol, and a voice synthesizer. A special external

2m antenna will be attached to the outside of the Mir space station for this project. The first AREM operations are expected to begin around January 1991 when an Austrian cosmonaut will install the station after he joins the crew of the Mir. After the Austrian cosmonaut finishes his mission on Mir, the equipment will remain aboard the space station. It is envisaged that an upgrade to this station will be to incorporate Bulletin Board System (BBS) software on the lap-top computer. This upgrade is not expected to happen until November '91. Also, it must be emphasized that if the cosmonauts wish, at any time they can pick up the microphone and call CQ. To obtain further information about AREM, please write to:

Wolf Hoeller (OETFTJ)
Amraserstrasse 19
A-6020 Innsbruck
Austria

I hope to be able to serialize a set of articles covering the PACSAT protocols to be employed. Due to size of the articles they will have to be split between AR issues. The introductory article is an overview.

PACSAT Protocol Suite — An overview

Harold E Price, NK6K

Jeff Ward, GO/K8KA

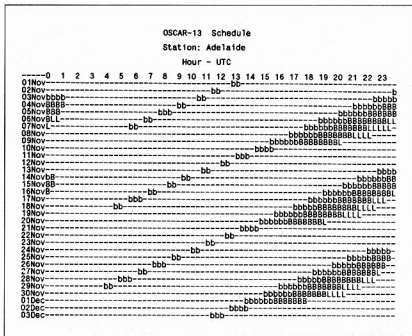
ABSTRACT

A low earth orbiting "Pacsat" has been described in the past as an orbiting bulletin board system. This is an over-simplification. A PACSAT is a multi-channel, full duplex device, with short, periodic access times dictated by orbital mechanics. These attributes mandate a different approach than the standard command-line interpreter style of BBS if the full potential of a PACSAT is to be realized.

The authors propose a new methodology for a PACSAT, and have developed several new protocols to implement more efficient access. These protocols all use AX.25, either in connected mode or with UI frames. This paper provides a description of the access model, and an overview of the new protocols.

Background

The authors have been struggling with the question "How can we make the best use of a bandwidth-limited low earth orbiting digital store-and-forward system with a worldwide, unstructured, heterogeneous user base" since an amateur Packet Radio satellite was first discussed in 1982. We began on air experimentation with the UoSAT-2 (UO-11) Digital Communications Experiment in December, 1984. In the following five and one half years, we've looked at where a resource like a PACSAT best fits in to the network as a whole. As a result of our study, we are proposing the use of a broadcast protocol as the basic downlink method, and a "file server" rather



than a BBS application as the basic service offered. This document provides a brief overview of these conclusions, the companion specification documents provide the implementation details.

This paper and the companion protocol specification papers assume that the reader has a basic understanding of the current packet radio satellites, for additional background, see references (1) through (6).

PACSAT

PACSAT is generic term in the amateur radio service for a low earth orbiting spacecraft which carries a large on-board memory for the purpose of data storage and retrieval by ground stations. A PACSAT can be the entire mission of a spacecraft, such as AMSAT-NA's AO-16, or a minor adjunct, such as the DCE on UO-11. The paper refers to the current "PACSAT" spacecraft — the University of Surrey's UoSAT-3 (UO-14) and the AMSAT Microsats AO-16 and LO-19. These spacecraft will be the hosts of software developed by the authors which implements the protocols described herein.

Each of these spacecraft is different. AO-16 and LO-19 are the most closely related, based on AMSAT's Microsat design. From the user's point of view, they have four 1200 bps uplinks and one 1200 bps downlink. These are switchable to 4800 bps, but no ground modems exist at this time. UO-14 has a single uplink and downlink, at 9600 bps. Although the on board computers are different, they are compatible at the application software level, permitting the same software to be used on all three.

In spite of these differences, all of these

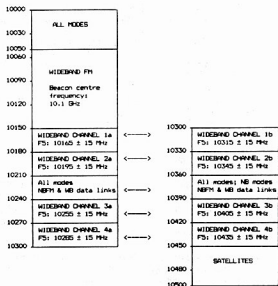
spacecraft share the following attribute: each is a bandwidth limited device. The number of uplinks and downlinks is much less than the number of users, and the capacity of the link is much less than the offered load. Each is only visible to a particular user for about 14 minutes, four or five times a day at middle latitudes. We feel that this is the critical design driver, and the access methods must be optimized with this in view.

Keep in mind, however, that even while subject to access time limitations, the satellites can still move a prodigious amount of data, especially when compared to the current amateur radio long haul network standards. A typical gateway station, moving traffic from the US to the UK on 20 MHz at 300 baud, assuming the band is open for 16 hours, could move 1.7 million bytes of data per day, if the link was 100% efficient. The average HF link is not 100% efficient, at best it is perhaps 30% efficient. The link is only half duplex, so this data transfer is one way only.

UO-14, even with only 56 minutes of access time per day at 9600 baud, can move 3.2 million bytes of data in one direction. The excellent link quality of the current PACSATs, combined with their full duplex nature and the protocols we are proposing, can approach 90% efficiency. Full duplex means transfers can occur in both directions simultaneously, so that UO-14 could move nearly 5.7 million bytes of data between the US and the UK in a 24 hour period, vs 0.5 million bytes over an HF circuit.

The desire to realize this potential is the reason we choose some non-traditional (for the amateur radio service) access methods for

Proposed Revised 3cm Band Plan



Stolen Equipment

Stolen from Ken Hanby VK4IS, 17 Kig Heights, 14 Queen St, Caloundra, on 27 July from Hooper Education Centre, Wavell Heights: **Kenwood TM231A**, Ser 0051016 and **TM441A**, Ser 6010370, and, on 15 August from same address: **Ex-CFA Philips 10-channel**, Ser 44982, **GME 40-channel AM TX830** Electrophone, Ser 8770556. Contact owner or nearest police station.

Education Notes

To conserve space for this special antenna issue, Brenda Edmonds VK3KT has graciously consented to defer her regular column until November. Thanks Brenda.

RANDOM RADIATORS

RON FISHER VK3OM AND RON COOK VK3AFW

A Wire Signal Squirter for VHF

This is a contribution from Andrew Russell VK5ZUG, who writes as follows (some minor editing has been done).

"The use of long wire antennas at VHF and UHF seems obvious in retrospect as it is easy to make them many wavelengths long. Although not offering the steerability of a beam, a rolled-up loop of copper or aluminium wire takes up little space. It is possible then to get a reasonable antenna into a small Japanese car along with the XYL, rig, feedline, food, luggage, etc when setting off to the seaside for a holiday.

I used a length of wire cut to 10 half waves long on 2m (10m approx) fed via 1/4 wavelength stub (52cm approx) to match a 50Ω line. (Ref Fig 1) The feed point XX was adjusted for the best VSWR, starting 1/3 of the way from the shorted end. The length of the

wire can be adjusted to give an improved match. An SWR of 1.2 to 1.5:1 should be easily obtained.

This antenna has gain along the axis of the wire in both directions, with the main lobes getting closer to the wire axis as the wire length is increased. Low-angle radiation can be obtained by sloping the antenna in the direction of interest. Terminating the antenna and using a balanced feed have not been tried, as the increase in performance did not seem worthwhile.

Over the path from Victor Harbour to Mt Gambier and SW Victoria it seemed to work as well as a five-element Yagi used on previous occasions. I hope to make some direct comparisons with a three-element quad in future.

This wire antenna can be readily assembled from available materials for use in field days or in emergency situations."

An interesting antenna, Andrew, which,

when installed horizontally 3m or more above the ground, should work very well indeed. Terminating it might be difficult in the absence of a good metallic ground plane. Thank you for the contribution; please let us know about your quad tests.

More Success with a Windom

Lee VK6HC has written to describe his success with a Windom using 136 feet overall and tapped at 44.4 feet or 32.6 per cent. Why is the Carolina Windom tapped at 38 per cent, he asks? There are several reasons. The best tapping point varies with height above ground and the ground conductivity. Both these variables change the impedance at a current maximum quite considerably so a five per cent variation in tapping point is not too surprising. Further, if the antenna is cut for resonance at a different frequency from that at which matching is done, there will be a variation in the position of the tap for lowest VSWR. Another area for the experimenter to invest some time!

A Failure with a Trapped Dipole

Another VK3 has written in saying that he tried the 18/24MHz trap antenna described in January AR, but the VSWR was about 5:1 in the amateur bands and reached a minimum value well outside the band limits. The antenna was only 3m above the ground and we think this was too low. Further, as indicated earlier, the impedance of an antenna depends on its height above ground, major variations taking place at heights of less than a wavelength. This design of antenna relies on a

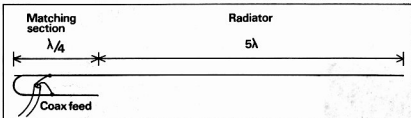


Figure 1 Sketch of a long wire for two metres. The length of the radiator should be a multiple of a half-wavelength

With a broadcast protocol, a ground station can simply monitor the downlink and accumulate files of data. Since files gathered in this way will have been unsolicited, the format of the contents may not be known to the user. For example, if one asked for a file of NASA format orbital elements, one can make a good guess that the resulting file contains NASA format orbital elements. However, if a "random" file is captured, its contents may not be understandable simply from inspection. Some additional information, such as a file name, data type, description, creation data, etc, may be required. Each broadcasted file, therefore, needs a header in a standard format with this information. The specification titled "PACSAT File Header Definition" describes a method of providing this information.

We hope that the broadcast protocol promote efficient use of the downlink. It should reduce the number of requests for files of general interest. It should also reduce the uplink loading, since a broadcasted file does not receive an ack for each frame or group of frames. In the best case, only an "ack" is sent for an entire file, and that would be the request to stop broadcasting it.

Even though the sky-to-ground link is broadcast in nature, the ground-to-sky link is not. PACSAT "sees" many ground stations at one time. For this reason, a connected-mode, not broadcast file transfer method is also defined, and is described in the paper on "PACSAT File Transfer Level 0".

(Continued next issue.)

73s from Maurie VK5EA

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SATELLITE ACTIVITY FOR JUNE/JULY 1990

1. Launches

The following launching announcements have been received:

Int'l No	Satellite	Date	Nation	Period min	Apog km	Prg km	Inc deg
1990							
050B	USA 60	Jun 08	USA				
050C	USA 61	Jun 08	USA				
050D	USA 62	Jun 08	USA				
057A	METEOR 2-19	Jun 27	USSR	104.1	974	951	82.3
058A	GAMMA	Jul 11	USSR	88.5	233	190	51.6
059A	BADR-A	Jul 16	Pakistan	96.3	984	201	28.4
060A	RESURS-F7	Jul 17	USSR	88.9	278	194	82.3
061A	COSMOS 2085	Jul 18	USSR	24hr01m	35889		1.4
062A	COSMOS 2086	Jul 20	SSR	88.7	258	191	82.3

2. Returns

During the period thirty six objects decayed including the following satellites:-

1970-064A	COSMOS 358	Jun 26
1989-088A	COSMOS 2049	Jun 19
1990-027A	OFEQ-2	Jul 09
1990-042A	COSMOS 2077	Jul 04
1990-044A	COSMOS 2078	Jun 28
1990-053A	COSMOS 2083	Jul 03

3. Notes

1990-056A INTELSAT 6 F-4

Orbital parameters are period 958.8 min, apogee 38374 km, perigee 1328 km, inclination 1.4 deg.

1990-059A

BADR-A

Was launched by the People's Republic of China using the Long March 2 cluster launch vehicle.

BOB ARNOLD, VK3ZBB

ar

REPEATER LINK

WILL MCGHIE VK6UU

WATERLOO CRESCENT LESMURDIE 6076

10 Metre FM

Several years of discussion and some construction has still not seen VK6RHF on air. A change in the final form of the repeater has taken place. Instead of a 10 m input and a 10 m output as is the case with the standard repeater, a cross band system is to be put into service. This will consist of a VHF input/output and a 10m input/output. It is important to note that a station on 10m can not talk through the repeater system to another station on 10m.

There are several reasons for the departure from the standard 10m arrangement. 10m repeaters are difficult to put on air; due to the narrow frequency difference between input and output they require a split site. The receiver is at one site and the transmitter, several kilometres away, at another. The two sites are linked together via UHF. In short — a lot of work.

The 10m system can be switched to trans-

ceive on a frequency split such as the 10m repeater VK3RHF in Melbourne. Mobile or home stations in Perth can then talk via the 10m system in Perth to the Melbourne repeater. The VHF input would be CTCSS encoded to gain access to the 10m system. If you have ever monitored 10m FM for any length of time, you would soon find it is a band full of signals and strange sounds. It may be required to fit CTCSS decoding on the 10m input.

10m FM is at times as good as 2m, with signals sounding like they are just down the road. Both the Melbourne and Wollongong repeaters are heard noise free in Perth every day for long periods of time. See you on 10 via 2 soon I hope.

Bit Scratchy

We have all heard signals on the local repeater that have next to no audio, and others that blow you out of the car. Why is it,

with all this modern technology, that the audio level varies so much from FM rig to FM rig? The answer is simple. Voice levels vary from amateur to amateur, and so does their operating environment. For the amateur operating from the shack, these different audio levels are not a big problem, but pity the poor mobile operator riding the volume control. Most transmitters do have a mic gain pot, but not everyone is prepared to lift the lid and adjust the audio level. Some rigs, even the very latest, do not have a mic gain pot. The solution is to fit all FM equipment with a front panel mic gain pot that can only be adjusted with a small screw-driver, through an access hole. Then you adjust the mic gain to suit your voice and operating situation. So please — makers of amateur FM mobile equipment, do this small thing, and let the long suffering mobile operator keep both hands on the wheel.

Duplex Linking

Correspondence received from Colin VK3BLE (in answer to my question — why the frequency pair for linking two repeaters?) makes interesting reading. From Colin's letter "the choice of full duplex was a deliberate one, to enable the remote repeaters to be

controlled via the links, even if they are locked on. Our repeater controllers have this ability built in. The other reason is to enable the audio of two repeaters to be mixed even if they are both keyed at the same time. This has proved itself beneficial in WICEN situations during bush fires on the portable WICEN system. This enables you to talk over incoming noise or traffic if necessary."

Control of the link system is a very important part of linking repeaters. If the link system locks up in the transmit mode from the distant end to the control end, then remote control of the overall system is lost. Duplex links solve this problem. Colin also mentioned that repeaters to be linked are VK3RLV to VK3RGS and VK3REB to VK3REG and VK3RGO. Thank you Colin for your reply.

Repeater Linking Standards

A proposal from Will Scott VK4XP on repeater linking standards makes for interesting reading. In short it proposes 4 points.

1. Assign a CTCSS tone to each grade of

license.

2. Assign a unique 4 digit number to each repeater.
3. Use DTMF for user control of linking destination.
4. Audio feedback to identify status of linking.

If I understand Will's proposal, the 4 points are a very simplified outline of a very comprehensive document. As many of us have found, repeater linking is complex. It may look simple, and to the end user be simple to operate, but the engineering behind linking is complex. The West Australian Repeater Group put together a very similar document early in the year. The most fundamental conclusion was that each grade of licence had to be identified by the repeater to determine who is allowed to be linked to what. If you are involved in repeaters, it would be in your interest to obtain a copy of this document along with WARG's submission.

Wollongong 10m Repeater

I received some information from Rob VK2MT regarding the Wollongong 10m re-

peater. Most of this information is widely published and need not be repeated. An interesting and frustrating fault on the UHF link between the 10m receive and 10m transmit site took considerable time and effort to find. The fault manifested itself as a repeating pulse sound on the audio. I know the problem has been solved, but as yet do not know what was causing the problem. At the time it was thought to be external to the installation and in the UHF spectrum somewhere. When talking to Rob on the phone, he said the whole project was far more difficult than his wildest nightmare. I can only sympathise with Rob that an apparently simple project takes 10 times the effort originally thought. The 10 times rule is a good one to apply to all projects when estimating the time and effort required. If it can go wrong it will. If it can't go wrong it still will go wrong. All the best to VK2RAH, look for this repeater on 29.520 MHz input and 29.620 MHz output.

AT

DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

Gladesville ATV Test Transmission Via Aussat

Expanded coverage of the regular Wednesday evening test transmission from VK2TVG is scheduled to be relayed through AUSSAT 2, transponder 5, vertical polarization. This is a 12 watt south east beam which covers VK1, 2, 3 & 7 plus southern VK4 and eastern VK5. There may be a spot towards Perth. Time 7 to 10.30 pm Eastern Australia Summer Time, 14 November 1990. Thanks to AUSSAT for the facility they have extended to the Gladesville Amateur Radio Club. Listen to your WIA Sunday news broadcast on 4 and 11 Nov for last minute details. (See *Gladesville ARC item Club Corner* — Ed.)

QSL Bureau

A reminder to all members to advise what inward card handling arrangements you require, including the advice that you don't collect. With the volume of cards coming through the wishes of all must be known.

WICEN (NSW) Inc

The major exercise this month will be the Hawkesbury Canoe Classic on 3rd/4th Nov. The Hunter Region "Lake Macquarie Dash" scheduled for late in the month has been transferred to 1991 sometime.

Broadcasts

VK2WI transmits twice each Sunday, 1045 and 1915 hours local time. With the change into daylight saving the 30 metre 10125 kHz transmitter may be used in the evening for a trial period for the longer haul coverage. The Coffs Harbour and District ARC has recently joined with a relay of the morning broadcast through their local 2 metre repeater VK2RCH on 6650. A reminder that the deadline for broadcast material is 6pm Friday at the Paramatta office by mail, delivery, phone or fax. (Details on page 3.) Packet material to VK2WI @ VK2RWI. Voice mail headlines or news submission via (02) 552 5188.

Publications

A reminder that the latest Australian Callbook is available from the Divisional office. Cost details are given on the broadcast. A list of publications available from VK2 is included with the callbook; or collect one from the office. If you require a copy by mail send in a stamped, self addressed 9 x 4 envelope.

New Members

A reminder to members and clubs about the recruiting drive until the end of the year. Most clubs should have a stock of application forms so get one or more at your next club meeting and sign up your non-member friends. During September the following joined the NSW Division and a warm welcome is extended to them.

J Andrews	Assoc	Hornaby Heights
W W Aulsebrook	Assoc	Forster
P M Buckland	Assoc	Hornaby

P J Carter	VK2ETK	Orange
R Cason	Assoc	Stannmore
I W Dempsey	VK2TRX	Molong
D R Dukes	VK2VLN	Penrith
D J Hardwicke	Assoc	Blacktown
P M Hewitt	VK2TH	Dagbo
D J Joyce	VK2GG	Morisset
B J Kelly	VK2KJ	Tamworth
R J Law	VK2MBL	Forbes
M Livers	VK2MEA	Mullumbimby
S G Marshall	VK2NSM	Murwillumbah
J J McFarlane	VK2NFX	Miranda
D H Moss	G6VNT	West Ryde
		(Surrey England)
D Nickell	Assoc	Bonsley Park
W W Price	VK2JGP	Argenton
A R Stuart	VK2ALX	Balgowah Heights
G C Wakefield	Assoc	Dulwich Hill
M C York	VK2GFS	Blacktown

AT

VK3 NOTES

JIM LINTON VK3PC

Turbo Tutorial

As part of its education activities, WIA Victoria has arranged a special eight hour "Turbo Tutorial" day on Sunday November 18.

The course, being held at centrally located Canterbury, will concentrate specifically on the AOCF Theory syllabus and those attending should have at least Novice theory level knowledge. The instructor will be Fred Swainston VK3DAC, well known as the author of the Radio Theory Handbook for Amateur Operators.

TT Day is ideal for candidates sitting the AOCF theory exam at this month's WIA Victoria examinations. Applications to join the course close on November 6. For further information, contact the WIA Victoria office without delay.

TVI Filter Kits Popular

Since their introduction in September, the kits of TVI and VCR interference filters on

loan to members have been consistently booked out. The kits can be borrowed by members having TVI or VCR interference problems — and reports we've received indicate this is an increasing problem for radio amateurs.

The scheme is that members pay a nominal security deposit and undertake to return the filters within a prescribed time. The kits can only be borrowed in person from the WIA Victoria Office — they're not available by mail order.

The idea is to borrow a complete set of filters and try them to find the one which cures the problem. Knowing the exact filter needed to overcome a particular situation means the interference can then be quickly fixed with the permanent installation of the right filter.

The TVI and VCR Interference Filter Kit — another membership service of WIA Victoria.

Trial Examinations

Requests for the Trial Novice and AOCIP theory examination papers, and the Regulations trial exam have been received from throughout Australia. These are proving very popular for candidates sitting the real examinations and wanting to brush up on their theory or regulatory knowledge.

The theory examination papers have just been updated with the addition of some new questions.

They are available on mail order only from WIA Victoria with a trial theory exam (specify AOCIP or Novice). Price is \$12 for either Theory exam, \$8 for the Regulations. The cost includes a marking service to help candidates identify their study weakness areas.

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5/8 WAVE

JENNIFER WARRINGTON VK5ANW

Picnic

The Council, attempting to make the best use of its available person-power and resources, came up with what they thought was a great idea. They would make a donation to a club or pair of Clubs, North and South of the city, if the said groups agreed to organise the picnic. Adelaide Hills and South Coast clubs, were approached in the south, and Riverlands and Barossa were the northern clubs. As far as I know, Barossa has been the only one to accept, and theirs will be held in March 1991 at Mount Pleasant Oval.

Members Equipment Display Night

This year 10 exhibitors displayed 14 items between them. The ICS Award went to the group responsible for building the Elizabeth ARC 70cm repeater, namely, Bill VK5ZDV, Dallas VK5WA, and Trevor VK5ZTJ. Dave Minchin VK5KK won an ESC voucher for his test antenna (a double figure of 8) and a 23 element Yagi, also for his 1296 transverter. Martin Luther VK5GN also won an ESC voucher for a mic pre-amp, and a broad-band RF Amplifier. Clarry Castle VK5KL did a beautiful job on his 50 MHz linear amp and received an ESC voucher also.

The Merv Millar Encouragement Award was won by Colin Taylor VK5CE with his "novel" junk box Power Supply (the box and transformer began life as parts of a Pool Chlorinator!) Our thanks to Merv VK5MX, who continues to encourage "homebrewers" in this way. I believe John (harmonic of Steve VK5AIM) deserves a special mention. At 7 years, John has to be our youngest ever participant. Keep up the good work John. At this rate, it won't be long before Steve is

sharing the shack with you and Mum!

ATV Merger

At a meeting on Sept 15th, it was resolved unanimously that the SA ATV Grp and the Southern ATV Grp should merge.

The name of the group will continue to be the SA ATV Grp Inc but at a subsequent meeting a new Committee will be formed, and can then sort out the 1296 licensing problems. They also intend extending invitations to past SA ATV Grp members, particularly in the Elizabeth and Northern areas, to join them once again.

Westfield Displays

We have been offered the opportunity to put Display Stations in the Arndale, Marion and Tea Tree Plaza shopping centres, possibly for a week at the end of the school holidays in Jan '91. Obviously we will need volunteers. If you would like to be part of this, please let Rowland VK5OU or John VK5BJM (or any member of Council) know. It really is a very rewarding experience.

By the time you are reading this, JOTA will just be a pleasant (we hope) memory. Our thanks to Peter Koen, Project Commissioner for Scout Radio Activities, for keeping Council and members informed and injecting his own "spark" of enthusiasm; also, for achieving the Ausat link and the V15 Prefix.

Diary Dates

Tues Nov 26

Computer Night

Bring along your computer, any "amateur" oriented programs (contest logging, satellites, etc) (also extension cords etc).

Tues Dec 4th

Christmas Meeting

Come and hear Keith Rendell — a highly entertaining speaker — bring your spouse and a plate of supper, to Woodville Community Hall, 64C Woodville Rd, Woodville. ar

WICEN

IAN NANCE VK2BIN
PRESIDENT WICEN (NSW) INC

Funding!

It's good news time for the members of WICEN (NSW) Inc!

The NSW Volunteer Rescue Association, which is WICEN's parent organisation in this state, held its 22nd annual conference in Sydney on the 15/16 September.

The mood of the meeting rose considerably when the NSW Minister for Police & Emergency Services, Ted Pickering, handed VRA President Max Walters a cheque for \$375,000. This amount represented \$79,000 as an immediate allocation for VRA training, administration, and special assistance fund, with the balance going to the accredited VRA units

who were given an immediate grant of \$2000 each.

The Minister also announced an Incentive Grant of up to \$2000 per squad which the government will match on a dollar-for-dollar basis for donations raised in the financial year 90/91.

Recognising the difference between local rescue squads and groups such as WICEN who have state-wide responsibilities, the Minister doubled our Immediate Grant to \$4000, and raised the ceiling on the Incentive Grant to \$4000 also.

This funding of volunteer services is in line with the complete re-think of disaster planning policy for NSW, and follows the introduc-

tion of the State Emergency and Rescue Management Act 1989.

A condition attached to receipt of the Incentive Grant is that all units retain their accreditation, undertake training on a regular basis, possess equipment of acceptable standard, and report regularly on their operation and training.

That's exactly what WICEN is currently doing as part of its role as the state's emergency electronic communications resource, and now's a good time to suggest to amateurs who are not WICEN members that they are in a unique position to serve their community in times of emergency or disaster.

If you, as a concerned amateur, are prepared to support NSW rescue and emergency operations in a professional way and would like to join WICEN (NSW) Inc, call in on one of the various regional nets or write to us at PO Box 123 St Leonards NSW 2065.

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QSLs FROM THE WIA COLLECTION (28)

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139

Bahrain — Middle East Emirate — Part 1

Bahrain is really an archipelago of some thirty small islands in the Persian Gulf lying about 24 kms off the coast of Saudi Arabia, not very far from troubled Kuwait, which lies to the north west at the top of the Gulf. The main island is called Bahrain Island, and is the only one of any importance. Its population is about half a million, approximately half of whom are Iranian descendants, the other half coming from Saudi Arabia. Almost all are Muslims. Early amateur activity was carried out by British nationals. In fact, Britain has exerted an appreciable influence in the area for many years. Several treaties of protection were negotiated as early as 1820, which were related to Britain's policy of keeping the Gulf free of any power that might threaten trade routes to India. In return for protection, rulers could not enter into relationships with other nations without British consent. Bahrain was never a Colony or a Dependency, the country being ruled by an Emir of the Khalifa family. This was the family who ousted the Persians in 1783, and which has been the power in the country ever since.

XY16BZ

This QSL of the WIA collection should be one of the rarest in the world. It was sent to Val Petruchenia VK3DT (later VK2VS) for three QSOs in the 1930s, the earliest one being in December 1932. As pointed out in earlier articles, the letter X preceding the normal prefix of a callsign indicated a portable station. (See "QSLs of the WIA collection" in "Amateur Radio" August 1988.) This station belonged to an RAF squadron member based at Basrah, Iraq. It would be one of the very few stations operating out of that country at that time, when Bahrain was not generally recognised as a "DX country".

In 1934 the "Radio Amateurs' Handbook" listed the prefix allocation VPA-VSZ as British colonies and Protectorates, but there was no mention of Bahrain. Possibly the first listing of this country was in 1935, when the March issue of the radio magazine "R9" suggested the prefix VS8 for Bahrain, under the heading of an article entitled "British Empire Prefixes". (This prefix was also shared with the island of Kuria Muria.) During the 1930s there were several suggestions for callsigns which led to some confusion amongst radio amateurs. The "Radio Amateur Handbook" of 1936 suggested that the VS8 prefix be allotted to Straits Settlements. Callsigns

became more defined in the years just before the outbreak of war. The "Wireless Weekly Callsign Book and Technical Review" of 1937 lists Bahrain as VS8 (together with VS7 Ceylon, VS9 Maldives). One of the most active stations at that time was VS8AA (during 1938 and 1939.).

VU7JU

Both the VS8 and a new prefix, VU7 seem to have been used just before the war. (VU7BR was active both during 1938 and 1939.) The VU7JU QSL shown here is dated April 1947, and was for a QSO with SK Bob Grundy, VK5BG. The owner of the Bahrain station was also a member of the RAF. Although both the VS8 and VU7 prefixes were to be found in post-

war DXCC lists, the VU7 prefix would seem to be the only one used at that time. It is the only prefix listed in the QST issue of February 1947 which publication set out a "Post-War Countries List". This was the official list for ARRL DX Contest and Post-War DXCC.

Next Month: Bahrain — Middle East Emirate Part 2.

If you would like to play a part in building up the WIA QSL collection and to save something for the future, would you please send a half-dozen (more if you can spare them) QSLs which you feel would really help the collection along.

To VK5BG from **VU7JU** **BAHRAIN ISLAND, PERSIAN GULF**
Lat. 26 16 N. Long. 50 26 E

Thank you for the radio (telephony/telegraphy) contact of 8/4/1947 at 1132 hours G.M.T. on the 2F.M. band. Your signals were Readability 1/2 Strength 6 Tone

Modulation Transmitter here C.C. with 30w input to an 807 feeding a full wave W8JK aerial. Receiver, Eddystone Model 504.

Cards should be sent via R.S.G.B. or to the address given for G3JU in the Call Book.

Best Wishes,
S. G. ABBOTT, G3JU, Ex. U3JU.

Morseword No 44

	1	2	3	4	5	6	7	8	9	10	Across
1											1 Keen
2											2 Boyfriend
3											3 Ceremonies
4											4 Parts
5											5 Cabbage
6											6 Boss
7											7 Sheep
8											8 Ready
9											9 In what way?
10											10 Wheeze
	1	2	3	4	5	6	7	8	9	10	Down
1											1 Monkeys
2											2 Awkward
3											3 Platform
4											4 Subs
5											5 Arid
6											6 Terror
7											7 Base
8											8 Leveret
9											9 Stand for coffin
10											10 Recliner

Audrey Ryan © 1990

Solution Page 56

All cards are appreciated but we especially need commemorative QSLs, special event station QSLs, especially assigned call QSLs (eg VK4RAN), pre-war QSLs, unusual prefixes, rare DX and pictorial QSLs of not so common countries. Could you help? Send to PO Box 1, Seville 3139 or phone (059) 64 3721 for card pick-up or consignment arrangements for larger quantities of cards.

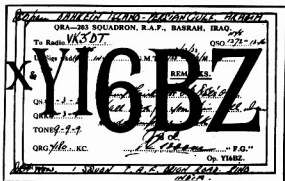
Thanks

The Wireless Institute of Australia would like to express its thanks to the following for their contribution of QSL cards towards the collection:

(Supplementary List)
Bob VK7KZ
Jim VK9NS
Frank VK2QL
Bob W5GTY

Also the friends and families of the following "silent keys" (Supplementary list).
Brian Austin VK5CA
Frank
Bridgewater VK2ZI

AT



CLUB CORNER

Southern Peninsula Amateur Radio Club

The Annual General Meeting of the Southern Peninsula Amateur Radio Club was held at the club rooms in Rosebud, on Thursday, 4th October.

A vote of thanks was expressed to retiring President, Syd Keighley VK3DSP.

Elected office-bearers for the coming year are:-

President	Vic Vickery	VK3DEA (059) 861327
Vice President and Publicity	Tony Hamilton	VK3ENE (059) 864927
Secretary	Frank Feldman	VK3BC (059) 862031
Treasurer	Phil Carne	VK3AAM (059) 854784
Committee	Don Robertson	VK3CK
	Stewart Backhouse	VK3NV
	Alan Robinson	VK3SQ
Social Secretary and QSL Officer	Margaret Hamilton	VK3END (059) 864927

The SPARC club, which is comparatively small due to its location, has steadily progressed during recent years and looks forward to increasing membership in the future.

The club is a distribution point for QSL cards from the WIA Bureau. For further information phone Margaret (059) 864927.

The club conducts two nets a week on 3.620 MHz, Tuesday evenings at 7.30pm local time, and Sunday mornings at 9.30am local time. Any stations are welcome to join in. Enquiries and correspondence can be directed to the Secretary, PO Box 206, Rosebud, 3939, or phone (059) 862031.

TONY HAMILTON VK3ENE

AUSSAT Transponder For Gladesville ARC Television

Many amateurs may be aware that the Gladesville Amateur Radio Club — VK2TVG — in Sydney conducts a series of ATV test transmissions each week using a UHF ATV repeater on channel 35. (Vision 579.25; sound 584.75 MHz.)

Recently these tests came to the notice of

AUSSAT executives who approached Gladesville to find out more about the club and its function. AUSSAT then offered Gladesville the use of a transponder to conduct these tests over a wider coverage.

Further discussions took place and the test will be a joint operation between the Gladesville Amateur Radio Club and the VK2 Division of the WIA on the evening of Wednesday 14 November 1990, 7pm to 10.30pm Eastern Australian Summer Time.

The satellite to be used will be AUSSAT 2 — the most westerly of the three AUSSATs (156 E) — on transponder 5 using an unencoded PAL mode of transmission, 12 Watts, vertical polarized. The footprint will see at least south eastern Australia, which includes the State Capitals — Brisbane, Sydney, Melbourne, Hobart and Adelaide — not forgetting of course all the country regions in south east Australia. The 12 Watt transponder on this foot print is well received on a small dish. Outside the SE foot print the signal should be receivable on a larger dish over much of the rest of Australia. Some foot prints have a spot beam towards Perth.

For amateurs to benefit from this test transmission they will need to seek out AUSSAT

REFBYRNE

...repeater lists ... QSL bureau ... international shoe sizes ... beacons ...



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...knitting patterns ... Recipes ... Q-codes ... zodiac ... the rules of volleyball !!



Crystal! This 1991 Call - book you bought me is only VOLUME ONE !!



GAMEN

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receiving facilities and perhaps where practical patch the signal into their local ATV repeater or simplex TV transmitter.

Alternatively seek out a satellite receiving facility at a local service club, TV production facility, education facility or a local equipment dealer and make it a radio club meeting night.

Perhaps you have your own AUSSAT system and are able to invite amateurs and interested parties to your facilities.

Gladesville ARC would like to hear from as many people as possible who will be able to receive this test transmission. See contact list below.

Gladesville ARC conducts this weekly test transmission live on Wednesday night using their ATV repeater VK2RTV on channel 35+, from West Lane Cove in Sydney. The format consists of a prerecorded lecture on NAOCP or AOCPT theory followed by short technical or scientific items from sources like NASA, AUSSAT, Education colleges and material produced by Radio Amateurs, club lectures, projects etc. The presenter for the live transmission introduces each item and reads segments of news information from the

Gladesville Club, the WIA and ANARTS. The transmission is usually about 3 hours. Not everybody is able to see the transmission on Wednesday, so the log tape is replayed on Friday evening. Coverage from West Lane Cove is much of the North Shore of Sydney, the southern and south western suburbs and a few high spots like the eastern Blue Mountains. Much of western Sydney is in shadow from VK2RTV and a transmission is made on Thursday evening through VK2RTS which is in the eastern Blue Mountains. On Saturday evening Gladesville — VK2TVG — has a test transmission of computer and programming lectures. On Sunday evening the VK2WI broadcast is relayed, which is then followed by a selection of technical material. Gladesville records a range of lectures and classes for loan, the test transmissions and the Federal video tape library.

Gladesville is working towards extending the present coverage to other ATV repeaters and regions. In conjunction with the NSW Division, a repeater will be installed at VK2WI Dural and this site will be used to link to other locations.

The transponder booking has been made

by AUSSAT. It should be kept in mind that time changes may occur due to unforeseen satellite use. It is thought that this is the first time a national Satellite provider has carried an Amateur Radio test such as this one. The thanks of all to "AUSSAT" for the privilege.

For information about the AUSSAT test transmission on 14 Nov 1990 contact:-

Gladesville Amateur Radio Club
Keith Cunciliffe VK2ZZO
PO Box 48 Gladesville NSW 2111
Phone 02 427 0530

NSW Division of the WIA
Tim Mills VK2ZTM
PO Box 1066 Parramatta NSW 2124
Phone 02 689 2417
Fax 02 633 1525

Media inquiries. Media East
Tom King VK2ATJ
PO Box 140 Kensington NSW 2033
Phone 02 349 6683
Satellite reception. Videosat
Wal Shand VK2AXW
PO Box 427 Wahroonga NSW 2076
Phone 02 489 5474
Fax 02 489 3557

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE
NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr A E Sheppard VK2EDS*,
Mr Jock Simpson VK2DS
Mr Gordon Ewing VK2JS
Mr John Smith VK2NV
Mr John Traill VK2XQ
Mr T K Murphy VK2EBI
Mr Claude Singleton VK4UX
Mr M M Oosterbaan VK6QM

*Wrongly reported as VK2ED in
October issue.

Thomas Kevin Murphy VK2EBI

Kevin passed away at his home in Balgownie on 25 August 1990. Kevin, aged 80 years, died from a heart attack.

Kevin was born in Nowra and first became interested in radio when he listened to the broadcast (on a crystal set) of the take off flight of Kingsford Smith on his solo flight to New Zealand in 1929/1930.

Kevin married Theresa and became a family man. In 1941 the family moved to Wollongong

and Kevin took a job at Lysaghts as a electrician. In 1943, he joined the Volunteer Coastal Patrol. In 1974, after his wife's death, Kevin resumed in interest in radio.

He joined the Illawarra Radio Club in 1976, sat for his exam in 1979, and passed the same year. A year later he sat and passed his full call exam. And so the well known call of VK2EBI was hitting the airwaves..

VK2EBI (Kev) will be missed but not forgotten, and there will always be a token reminder in the Illawarra Radio Club room as the Murphy family has kindly donated Kevin's Morse Key to the Club.

MORRY VK2EMV

John Traill VK2XQ

John was born in 1909, in the town of Pelaw Main, a coal mining town in the Hunter Valley of NSW.

He obtained his Operating Certificate in 1933 and operated as VK2XQ in the towns of Quirindi, Maitland, Mayfield and Hamilton South.

John was a great exponent of CW and on

numerous occasions when I visited him he would be talking to me and at the same time be laughing at the message coming over the air on CW. He really enjoyed his amateur radio and kept in regular contact with the many friends he had made over the years, and particularly his mates from the days in the RAAF. John had many contact with overseas amateurs particularly with the late Jim Kirk G6ZO (Stanmore-London).

In 1949, in the true amateur spirit, he gave valuable assistance to the Police on the occasion of disastrous floods in the Maitland District. He placed his station at the disposal of the Police and relayed messages, which otherwise could not have been passed between the police at Maitland, East Maitland and Waratah. For this service he was presented with a special certificate of recognition.

John served in the RAAF during WW2 including No 8 Squadron Signals Section, Sembawang 1940, concluding as Squadron Leader and Commanding Officer "Headquarters No 1 Detachment No 4 Wireless Unit 1945.

John was a member of the WIA since 1946, and was a member of the RAOTC since 1976.

Our sympathies are extended to John's wife, two sons and daughter.

PETER KING VK2QK
ar

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OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 200 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS

Packet Extravaganza

I wish to add my support to the sentiments in Colin 9M2CR's article on HF Packet.

Much of the packet operation heard on HF consists of BBSs exchanging bulletins. I notice these BBSs need up to 10 retries before they can get even a small packet through successfully.

I recently saw a printed message received by Gerald V85GA from the DU1JMG BBS. The information part of the message is about 125 characters, but when the header and routing information is added it becomes about 2500 characters, or 20 times larger. The routing information indicates that it originated in ZL and passed through many BBSs; 3 ZLs, 5 VKs, 2 DUs, 28 JAs, and another 4 DUs.

Each time this message was passed on to another BBS, it grew by another 50 or 60 characters. Also, whenever this steadily growing message was transmitted on HF it was split into 20 or 30 character packets and each packet was transmitted 2, 3 or up to 10 times.

Obviously this is not the only message in the BBS networks.

Is the packet community working on a solution to this waste of spectrum time?

ANDREW DAVIS VK1DA/V85DA
PO BOX 715 SERIA 7007
BRUNEI DARUSSALAM
BORNEO (VIA SINGAPORE)

Talking Newspaper

(The following information was passed on to us by Greg Baker PO Box 93, Braidwood NSW 2622.)

QTI is a tape magazine for radio amateurs and shortwave listeners who are blind or partially sighted. Each issue consists of two C90 cassettes which contain technical articles on amateur radio topics which have been recorded by a team of readers in UK. The articles are selected from UK radio and electronics magazines. (Articles from mags published in Australia could be included if we had the magazines and the publisher's waiver on copyright for this specific purpose.)

Until late last year, 1989, QTI was distributed on our behalf in Australia, but due to falling support, both in terms of manpower and donations this has now come to an end. There are at least 30 blind radio amateurs in Australia who no longer receive QTI.

Can you spread the word that QTI Talking Newspaper Association is standing by to distribute QTI to the amateur radio community in Australia? QTI can be sent every three weeks by airmail. Under the facilities for the blind the postage is 10p only from UK. I believe

that there is a concessionary rate for the return trip. After use, the QTI cassettes are returned to base for recirculation. The tapes are erased and the new issue copied on to the blank tapes. A direct service can be offered for \$A15 per year.

If you are unable to help directly, please pass on the word or better still, send me the names and addresses of persons who are in a better position to do this liaison.

Very many thanks and best wishes.

HARRY LONGLEY G0JKT
QTI TALKING NEWSPAPER ASSOCIATION
7 ANDERSON CLOSE, LANCASTER
LA1 3JE UK
(TEL 0524 33207)

Those GOD Suffixes

The recent upset over callsign suffixes GOD in NSW, Victoria and Queensland, and the VK4 Division's condemnation of activities of a station allegedly running a religious net must surely cause deep concern among all amateurs. Our hobby has always been non-political and non-religious. For DoTC to re-issue the contentious callsigns stating the suffixes are just groups of letters, not words, without securing an endorsement of this view from the applicants, is to condone a misuse of the system.

We would not expect DoTC to pass judgement on a long-standing tradition which in point of fact observes, supports and is based on one of the Department's own regulations.

I express utter contempt for those who, knowing little or nothing about our traditions, try to use the hobby for ends having nothing whatever to do with amateur radio. ("Render unto Caesar"...etc.)

The holding of an amateur radio licence and callsign do not bestow on one the status of a private broadcasting station. If these people want to go on the air on religious matters, the proper course is to apply for either a public access station licence or a commercial broadcasting licence and do what the laws of this land entitle them to do in the proper place and with the appropriate means.

Those of us who deplore this situation are neither agnostics nor atheists — we are radio amateurs. We are proud of our hobby's democratic, international, non-political and non-religious ideals.

HARRY ATKINSON VK6WZ
5/97 RAILWAY PARADE
MT LAWLEY 6050

Information Please

Can anyone help me? I'm trying to get more details about an old 5 valve radio that I am going to attempt to restore.

The valve line up is 2 x UY-235 (TRF stages?) UY-224 (grid or plate pentode detector?), 47 power pentode & an 80. The last two I remember from my earliest radio days. The cabinet and chassis are stamped 10-84C.

Tuning is via a 3-gang capacitor and trimmer front knob.

Internally, the transformers, etc are stamped Emmco, Aust. The bypass capacitors are 0, 5 F Hydra, made in Berlin, and possibly dated VII 31. Could the radio be this old? The cabinet was made by a J. Ratner, of Sydney.

In the region of the aerial connection there are 4 terminals marked S (?), M, B, Earth. Any clues on the first 3?

Because of a socket connection, the radio obviously once had an electro-magnetic loudspeaker, which has been replaced by an 8M Rola and speaker transformer. Some resoldering appears to have taken place.

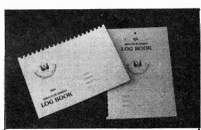
Does anyone know the details of the speaker magnetising coil, eg winding wire, d.c. resistance, a.c. inductance, number of turns? (or typical values).

Finally, two wires go from the 8uF, 525V electrolytics back into the power transformer.

I can only speculate on this (apart from some sort of saturable reactor arrangement.)

Please note: Anyone who drops me a line, I will phone and then possibly use any HF band for discussion.

PETER WOOF VK1PW
PO BOX 305
DICKSON ACT 2602
ar



New WIA logbooks available now

at your Divisional Bookshop.

These quality logbooks are available in A4 format with plastic spiral binding so the book will open and lie flat on the bench. VERTICAL OR HORIZONTAL column layout is optional, with the traditional column headings. Price is \$5.00 each plus post and packing where applicable.

HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOGEE GROUP

November Charts

For ease of use and to accommodate space restrictions in the magazine, I have provided predictions applicable for three major regions of Australia:

VK East. Covers the major part of NSW and Queensland.

VK South. Covers southern-NSW, VK3, VK5 and VK7.

VK West. Covers the south-west of West Australia.

For each of these regions I have selected six "terminals" to major continental regions of the world. Note that, this month, I have included charts specifically for the Malpelo Island, in lieu of the Middle East charts which have featured over the past few months. This is to cover a DXpedition scheduled there for the first week of November.

Malpelo is an island located some 350 km west of Buenaventura in Colombia, on the north west corner of the south American continent. As this is well to the south west of the terminal I use for the North & Central America charts, you will notice significant differences between the predictions.

I understand there will be activity from the

South Sandwich Islands and South Georgia Island over the last few days of November through early December. I will include prediction charts in the December issue, but listen for advice on the VK2 and VK3 Divisional broadcasts on the last Sunday this month for updated information close to the event.

The Charts Explained

These charts are different to those you see published elsewhere, and arguably more useful to the amateur fraternity as they give, effectively, a value akin to the predicted signal/noise ratio for each hour and for selected bands.

The charts are organised in 24 rows, one for each hour UTC (first column on the left). Don't forget to add the appropriate number of hours for your time zone, including daylight saving where it applies. The next column gives the MUF (maximum usable frequency) for each hour, followed by the field strength at the MUF, in decibels referred to 1 µV/metre (dBu), the column marked FOT gives the "optimum frequency — the most reliable frequency for the path.

Then come five columns, one for each of five selected HF bands. The numbers in the column represent predicted field strength at each hour in decibels referred to 1 µV/metre. Here it represents "raw" signal to noise ratio as urban noise levels are typically 1-2 µV/metre, but does not take into account the advantage offered by particular transmission modes. The results are based on a transmitter power of 100 W output (except where noted later), the use of modest 3-element beams or similar, and for "median" conditions. Where the results fall below -40 dB, no output is printed.

Enhanced conditions may improve S/N ratios by 9-15 dB. The use of CW or digital transmission modes show better results than SSB. If you've got 400 W output, you get a 6 dB improvement. Where conditions warrant it, I have included predictions for the bands below 14 MHz, deleting the upper bands.

The Monthly Sunspot Numbers

The values of the predicted monthly smoothed sunspot numbers that I use to generate these charts, supplied by IPS Radio & Space Services, have begun to trend upwards in value. This is a good sign. At the time of writing, it has moved from 143 for October this year, rising to 150.8 in January next year. This puts the predicted values near those experienced through the first part of this year, or to those prevailing in late 1988-early 1989.

UTC	HF	DMU	ROT	14.2	18.1	21.2	24.9	28.5
1	19.2	-5	13.5	-16	-6	-5	-4	-13
2	21.4	-5	15.4	-23	-9	-5	-5	-8
3	23.7	-16.5	-32	-14	-6	-6	-6	-6
4	25.1	-5	18.1	-10	-10	-4	-6	-6
5	26.6	-4	18.6	-10	-11	-12	-7	-6
6	27.1	-15.0	-30	-12	-12	-12	-7	-6
7	26.6	-4	18.6	-10	-12	-12	-7	-6
8	26.1	-4	18.5	-10	-12	-12	-7	-6
9	25.5	-5	18.2	-10	-12	-12	-7	-6
10	24.2	-5	18.0	-10	-12	-12	-7	-6
11	23.1	-3	17.7	-9	-4	-4	-3	-6
12	22.0	-3	17.5	-8	-4	-4	-3	-6
13	21.1	-1	16.8	-7	-1	-2	-7	-6
14	20.2	-3	16.0	-2	5	4	-1	-8
15	19.7	-9	15.2	-12	11	0	-7	-11
16	18.8	-12	14.4	-14	14	1	-11	-11
17	18.0	-14	13.6	-19	14	7	-13	-14
18	17.2	-15	13.0	-20	13	6	-13	-14
19	17.3	-15	12.5	-21	14	6	-5	-17
20	17.5	-14	12.0	-20	13	6	-5	-17
21	16.8	-10	11.5	-12	8	-9	-2	-21
22	16.2	-4	11.2	5	3	-12	-12	-24
23	16.2	-1	11.3	-3	-2	-5	-13	-23
24	17.2	-4	12.0	-9	-4	-5	-11	-19

UTC	HF	DMU	ROT	14.2	18.1	21.2	24.9	28.5
1	18.2	-4	12.5	-9	-4	-5	-10	-17
2	20.6	-3	14.8	-15	-5	-3	-6	-11
3	21.0	-5	15.3	-13	-5	-5	-5	-9
4	24.1	-5	17.2	-13	-13	-7	-7	-8
5	23.8	-7	16.3	-17	-16	-10	-7	-8
6	22.7	-8	16.8	-19	-18	-11	-8	-9
7	22.5	-9	16.4	-20	-19	-11	-8	-9
8	23.2	-9	16.4	-19	-18	-11	-8	-9
9	22.8	-9	16.2	-18	-16	-10	-10	-10
10	21.4	-8	15.2	-13	-8	-11	-8	-11
11	20.3	-8	14.2	-12	-8	-7	-8	-13
12	19.4	-4	13.5	-16	-7	-4	-8	-14
13	18.3	-3	12.7	-9	-3	-4	-9	-17
14	17.5	-1	12.1	-1	-2	-10	-20	-20
15	16.9	-4	11.9	-7	4	-11	-23	-21
16	16.2	-10	11.2	-13	6	-12	-27	-27
17	15.2	-12	10.8	-14	6	-2	-17	-31
18	15.1	-13	10.6	-15	5	-5	-19	-35
19	15.2	-14	10.7	-16	6	-4	-18	-35
20	16.1	-14	11.4	-18	9	-4	-14	-29
21	15.9	-11	11.1	-13	6	-15	-29	-25
22	16.5	-5	10.8	-6	1	-4	-17	-31
23	15.4	-2	10.9	1	-1	-17	-30	-20
24	16.3	-3	11.8	-4	-2	-4	-14	-25

UTC	HF	DMU	ROT	14.2	18.1	21.2	24.9	28.5
1	19.7	6	14.7	4	6	4	-2	-10
2	22.1	4	16.8	-3	4	5	2	-3
3	23.4	3	15.9	-11	0	3	0	-2
4	24.2	-2	16.3	-23	-6	0	1	1
5	25.8	0	21.3	-30	-10	-3	0	0
6	28.5	-1	23.4	-34	-13	-5	-1	-1
7	27.8	-2	22.8	-34	-14	-2	-1	-1
8	27.5	-3	22.4	-36	-14	-7	-3	-3
9	26.8	-3	21.5	-36	-14	-7	-3	-3
10	26.4	-3	21.4	-36	-11	-5	-2	-3
11	25.7	-1	21.2	-34	-7	-2	-1	-3
12	24.2	3	18.4	-14	-2	1	0	-3
13	23.2	3	16.8	-4	4	4	2	-3
14	22.1	3	17.4	6	9	7	3	-4
15	21.2	1	16.2	-1	15	10	4	-6
16	20.4	1	16.1	21	18	11	3	-6
17	19.8	14	16.0	22	17	11	2	-6
18	19.0	15	16.0	22	16	10	1	-11
19	18.3	15	15.3	23	16	8	-2	-14
20	17.5	14	15.3	22	14	6	-5	-18
21	16.7	12	15.3	22	13	5	-10	-21
22	16.5	15	15.3	23	16	9	-1	-13
23	16.7	13	14.1	19	8	-1	-11	-18
24	16.8	9	14.1	11	10	5	-3	-18

VK EAST — AFRICA

UTC	HF	DMU	ROT	14.2	18.1	21.2	24.9	28.5
1	13.1	-17	8.9	-32	-14	-15	-20	-29
2	12.4	-20	10.2	-39	-13	-14	-20	-30
3	13.3	-17	10.2	-35	-11	-14	-22	-32
4	12.5	-16	9.4	-32	-10	-14	-24	-38
5	11.7	-17	8.1	-31	-10	-13	-21	-33
6	11.6	-6	9.1	-4	-11	-20	-25	-31
7	14.2	3	11.3	9	-2	-16	-22	-28
8	16.9	9	15.1	17	12	6	-3	-34
9	22.3	10	17.0	14	11	7	1	-1
10	21.8	16	16.5	-3	6	-2	-3	-13
11	21.4	-4	17.0	-20	-7	-4	-4	-7
12	20.5	-11	16.2	-24	-14	-10	-8	-10
13	19.9	-17	16.0	-32	-22	-16	-12	-13
14	18.9	-27	14.7	-40	-27	-17	-13	-14
15	18.1	-27	13.9	-40	-25	-17	-14	-15
16	17.1	-30	13.1	-43	-27	-18	-15	-16
17	17.2	-31	13.0	-43	-27	-19	-15	-16
18	18.2	-28	13.6	-40	-28	-19	-15	-15
19	20.8	-21	16.4	-30	-20	-14	-11	-12
20	21.5	-18	16.7	-27	-18	-14	-11	-13
21	18.3	-23	14.1	-33	-23	-14	-14	-18
22	16.0	-27	12.5	-38	-30	-15	-15	-18
23	14.4	-29	11.0	-40	-37	-15	-17	-23
24	13.4	-30	10.2	-46	-45	-19	-19	-24

VK STH — AFRICA

UTC	HF	DMU	ROT	14.2	18.1	21.2	24.9	28.5
1	12.9	-20	9.8	-32	-15	-16	-22	-31
2	13.2	-22	10.1	-38	-13	-16	-23	-33
3	12.4	-20	10.1	-35	-12	-16	-25	-37
4	12.2	-16	9.5	-30	-10	-15	-22	-37
5	11.4	-13	8.9	-24	-12	-22	-27	-31
6	11.2	-8	8.8	-4	-14	-25	-31	-31
7	13.4	4	10.6	4	-5	-15	-28	-31
8	17.3	7	13.8	11	6	0	-21	-23
9	21.6	9	15.2	15	14	10	3	-4
10	20.4	16	14.3	16	14	7	1	-6
11	19.5	23	13.4	-2	2	1	-10	-15
12	18.7	24	12.9	-15	-6	-5	-13	-16
13	18.2	14	12.7	-12	-8	-10	-11	-15
14	17.2	-21	11.9	-34	-19	-14	-13	-16
15	16.5	-28	11.5	-40	-25	-17	-15	-18
16	15.9	-32	11.1	-43	-27	-17	-15	-18
17	16.0	-33	11.2	-43	-27	-17	-15	-17
18	16.9	-30	11.6	-40	-25	-17	-15	-16
19	18.9	-25	12.0	-38	-28	-19	-15	-15
20	20.2	-21	11.5	-34	-28	-14	-14	-14
21	17.3	-26	11.5	-38	-27	-15	-17	-17
22	15.3	-31	11.1	-40	-30	-16	-16	-20
23	13.9	-32	10.7	-40	-38	-15	-18	-24
24	13.2	-32	10.1	-42	-46	-19	-19	-28

VK WEST — AFRICA

UTC	HF	DMU	ROT	14.2	18.1	21.2	24.9	28.5
1	12.7	-29	9.8	-30	-19	-19	-28	-32
2	13.0	-34	10.0	-38	-28	-18	-22	-30
3	12.8	-31	10.0	-34	-27	-18	-24	-33
4	12.1	-30	9.4	-34	-27	-18	-24	-33
5	11.2	-29	8.8	-30	-18	-17	-22	-31
6	11.0	-25	8.7	-16	-17	-17	-24	-35
7	10.0	-12	10.1	-10	-12	-10	-10	-11
8	14.6	-3	12.2	-4	-4	-4	-16	-26
9	16.3	3	13.0	2	4	2	-4	-11
10	18.4	9	14.1	6	6	4	0	-6
11	20.9	4	15.6	2	5	4	0	-4
12	19.5	-2	15.0	-10	-2	3	-2	-11
13	18.5	-9	14.4	-15	-4	2	-3	-14
14	18.1	-18	14.8	-24	-19	-14	-13	-16
15	16.1	-24	14.4	-30	-24	-17	-17	-17
16	15.0	-27	13.5	-34	-28	-19	-17	-18
17	16.6	-33	12.7	-40	-37	-20	-17	-19
18	15.9	-37	12.1	-43	-40	-21	-18	-20
19	16.0	-37	12.0	-43	-40	-21	-18	-19
20	16.9	-34	12.6	-40	-38	-21	-18	-19
21	16.8	-32	13.1	-40	-38	-21	-18	-19
22	15.7	-39	12.5	-43	-43	-22	-19	-22
23	13.6	-40	10.6	-45	-45	-25	-21	-27
24	12.9	-40	10.0	-48	-48	-25	-21	-27

VK EAST — EUROPE L.P.

VK STH — EUROPE L.P.

VK WEST — EUROPE L.P.

UTC	MUF	DMU	FO2	14.2	18.1	21.2	24.9	28.5
1	24.8	13.18.6	6	14	15	13	9	
2	24.7	14.20.4	7	14	15	13	9	
3	24.1	14.19.9	8	14	15	13	9	
4	23.8	15.19.5	1	14	15	13	8	
5	23.2	16.19.0	14	18	17	13	8	
6	22.6	17.18.4	20	20	19	14	8	
7	22.0	18.18.2	27	25	21	15	7	
8	21.6	19.17.7	31	27	22	14	5	
9	20.4	22.16.4	32	27	21	13	3	
10	19.0	24.15.7	32	26	20	11	1	
11	19.3	24.15.3	32	26	20	10	-1	
12	18.7	24.14.8	32	26	18	8	-3	
13	18.1	25.14.7	32	25	17	6	-5	
14	17.1	25.13.4	30	22	14	3	-10	
15	16.3	25.12.6	28	20	14	1	-13	
16	15.3	25.11.8	28	18	8	-4	-10	
17	14.9	25.11.4	27	16	6	-8	-22	
18	15.4	24.11.7	26	14	13	8	-7	
19	17.7	18.13.7	21	18	12	2	-8	
20	20.7	16.15.8	16	17	15	9	1	
21	21.1	15.17.9	12	17	16	13	3	
22	24.2	14.19.0	10	16	16	14	9	
23	24.4	14.19.6	8	15	15	13	9	
24	24.8	14.20.1	7	14	15	13	9	

VK EAST - STH PACIFIC

UTC	MUF	DMU	FO2	14.2	18.1	21.2	24.9	28.5
1	25.9	5.21.0	-2	7	8	7	8	
2	25.5	5.21.0	-1	7	8	6	1	
3	25.3	6.20.7	1	7	8	6	1	
4	24.7	6.20.2	2	7	8	5	0	
5	24.4	7.19.9	6	11	10	6	0	
6	23.9	7.19.4	7	10	9	5	0	
7	23.4	11.19.0	20	18	15	8	0	
8	22.8	14.18.4	27	23	17	9	0	
9	21.6	15.17.4	32	26	19	7	0	
10	20.7	15.16.6	28	21	14	4	-7	
11	19.7	16.15.7	28	20	12	1	-12	
12	19.0	16.15.1	27	19	10	-2	-15	
13	18.2	16.14.4	26	18	7	-5	-19	
14	17.7	17.14.0	25	16	4	-7	-22	
15	16.8	17.13.2	24	15	3	-7	-27	
16	16.2	17.12.5	22	11	0	-15	-32	
17	15.5	17.11.8	21	9	-5	-20	-38	
18	15.4	18.11.7	20	7	-4	-20	-38	
19	16.3	9.12.2	11	5	-3	-16	-31	
20	18.5	6.13.7	4	4	1	-7	-18	
21	21.4	16.1	1	1	19	0	-8	
22	23.8	6.18.2	2	8	8	4	-2	
23	25.2	4.19.7	0	8	8	6	1	
24	25.6	30.3	-2	6	6	1		

VK STH - STH PACIFIC

UTC	MUF	DMU	FO2	14.2	18.1	21.2	24.9	28.5
1	26.0	0.20.7	-20	-5	0	0	-2	
2	25.8	0.21.1	-21	-5	0	1	-2	
3	25.6	0.21.5	-21	-5	0	1	-2	
4	25.3	0.21.1	-17	-3	0	1	-2	
5	25.0	1.20.5	-11	-1	2	1	-2	
6	24.6	1.20.0	-7	2	2	1	-2	
7	24.1	5.19.6	2	8	8	4	-1	
8	23.6	8.19.1	12	13	11	6	-1	
9	23.5	11.18.4	18	17	13	7	-1	
10	21.7	13.17.5	24	19	14	6	-3	
11	20.8	14.16.7	25	19	13	4	-6	
12	19.8	15.15.8	25	18	11	1	-10	
13	19.1	15.15.2	25	17	10	-1	-13	
14	18.4	16.14.4	24	16	8	-3	-16	
15	17.6	16.13.6	23	15	7	-3	-19	
16	17.2	16.13.4	23	14	5	-5	-22	
17	16.5	16.12.8	22	13	3	-11	-26	
18	15.8	16.12.1	21	12	2	-12	-29	
19	15.8	9.12.0	10	5	-3	-15	-30	
20	16.7	4.12.5	4	2	3	-12	-24	
21	19.0	1.13.1	1	7	16	5	-3	
22	21.9	0.14.5	-10	-1	0	-2	-8	
23	24.3	0.16.7	-15	-3	0	1	-2	
24	25.7	0.21.1	-14	4	4	1	-2	

VK WEST - STH PACIFIC

UTC	MUF	DMU	FO2	14.2	18.1	21.2	24.9	28.5
1	29.3	4.24.0	-18	-2	4	5	4	
2	29.7	4.22.5	-18	-2	3	5	4	
3	29.9	4.24.8	-21	-3	3	5	4	
4	29.6	4.24.4	-20	-3	3	5	4	
5	29.1	4.23.9	-17	4	4	5	4	
6	28.5	5.23.3	-12	2	6	6	5	
7	27.7	6.22.6	-5	6	8	5		
8	27.1	8.22.5	-1	11	11	8		
9	26.1	11.21.2	20	20	18	13	7	
10	25.6	12.20.5	23	22	19	13	7	
11	25.1	13.20.0	26	23	19	13		
12	24.9	13.19.8	28	24	20	13	6	
13	24.5	14.19.4	30	25	20	13	5	
14	23.8	14.19.3	32	17	16	8	3	
15	23.4	14.17.4	28	22	16	8	-2	
16	21.0	14.16.3	27	20	13	4	-4	
17	19.5	14.15.1	27	9	8	-14		
18	18.5	14.14.2	24	15	6	-6	-20	
19	18.4	12.14.1	22	13	3	-10	-25	
20	17.2	11.13.4	18	11	2	-12	-28	
21	16.6	7.16.3	15	13	8	0	-30	
22	19.3	8.22.1	5	13	11	7		
23	21.0	6.21.0	-6	9	8	5		
24	28.0	5.23.3	-13	1	5	6	5	

VK EAST - ASIA

UTC	MUF	DMU	FO2	14.2	18.1	21.2	24.9	28.5
1	29.2	2.23.4	-23	-5	1	4	3	
2	29.5	2.23.9	-23	-5	1	4	3	
3	29.1	2.24.1	-27	-8	-1	2	2	
4	28.9	3.23.8	-26	-7	-1	2	2	
5	28.3	4.23.7	-24	-6	0	3	2	
6	27.8	5.23.7	-19	-3	2	3	2	
7	27.3	6.23.1	-12	0	4	4	2	
8	26.4	8.21.5	-2	10	16	11	5	
9	25.1	10.20.8	-17	18	16	11	5	
10	24.6	12.19.7	23	21	17	11	3	
11	23.6	13.18.9	25	23	17	9	1	
12	22.4	13.18.0	26	21	15	7	-2	
13	22.1	13.17.6	26	21	15	6	-4	
14	21.4	12.16.8	26	20	14	5	-9	
15	20.9	11.16.4	26	19	12	2	-9	
16	19.9	10.15.5	25	17	9	-1	-13	
17	19.0	9.14.4	24	16	8	-2	-18	
18	18.0	13.13.8	22	12	3	-10	-25	
19	17.8	13.13.4	21	12	2	-11	-26	
20	18.5	10.14.0	11	12	7	2	-7	
21	21.4	9.16.0	15	14	9	2	-7	
22	24.9	6.18.9	7	9	6	1		
23	27.7	2.14.4	-4	1	4	4		
24	29.1	3.23.8	-17	-2	3	5	4	

VK STH - ASIA

UTC	MUF	DMU	FO2	14.2	18.1	21.2	24.9	28.5
1	27.6	4.21.9	-12	1	5	6	4	
2	27.2	4.21.5	-12	1	5	6	4	
3	27.0	3.22.8	-19	-3	2	4	2	
4	27.9	3.21.0	-20	-4	2	3	2	
5	27.1	4.20.9	-19	-3	2	4	2	
6	27.4	5.22.4	-14	-2	3	4	2	
7	27.0	4.22.2	-12	1	5	5	2	
8	26.1	6.21.4	-4	6	8	5	5	
9	25.7	7.20.9	6	11	11	8	5	
10	25.1	12.20.8	22	21	18	12	5	
11	24.1	13.19.5	24	22	18	12	3	
12	23.5	13.18.9	27	23	17	10	1	
13	22.8	14.18.2	28	22	17	8	-1	
14	21.9	14.17.4	28	21	16	7	-3	
15	21.1	14.17.5	28	22	16	7	-3	
16	21.5	14.17.5	27	21	14	5	-6	
17	20.5	13.16.9	26	20	13	4	-11	
18	19.3	13.15.0	24	16	8	-4	-17	
19	18.1	13.13.9	22	13	3	-10	-25	
20	17.0	12.13.2	19	11	2	-12	-28	
21	17.1	10.13.9	13	7	-4	-20	-28	
22	20.7	10.16.1	30	15	9	-1	-12	
23	24.2	6.18.9	-4	1	4	4		
24	26.7	5.20.8	-6	4	7	6	3	

VK WEST - ASIA

UTC	MUF	DMU	FO2	14.2	18.1	21.2	24.9	28.5
1	30.3	0.22.5	-36	-14	-5	0	1	
2	30.0	0.24.7	-24	-8	-1	3	3	
3	29.2	4.24.0	-16	-1	4	5	4	
4	28.8	6.21.5	-6	1	11	8	6	
5	28.1	8.22.9	4	11	12	11	8	
6	27.4	10.22.3	11	16	15	13	8	
7	26.7	12.22.0	11	21	19	14	9	
8	25.3	13.20.4	25	22	19	14	8	
9	24.4	14.19.3	26	23	19	13	6	
10	20.7	15.18.9	25	20	16	11	-3	
11	19.2	16.14.7	24	18	12	3	-7	
12	21.7	15.17.2	25	21	16	8	0	
13	20.9	11.15.5	19	14	4	-3		
14	20.1	9.15.7	7	8	4	-1	-8	
15	19.2	-13.14.9	-9	-2	5	-11		
16	18.2	-9.13.9	-20	-9	-7	-15		
17	18.0	-14.13.7	-28	-10	-10	-11	-15	
18	19.0	-16.14.2	-28	-10	-10	-11	-14	
19	21.8	-13.17.2	-23	-14	-10	-11		
20	25.4	-9.19.2	-9	-2	-15	-9		
21	28.4	-6.21.3	-2	5	-16	-11		
22	30.0	-4.23.4	-28	-15	-8	-5		
23	30.3	-1.24.6	-24	-10	-5	-1		
24	30.6	-1.26.8	-20	-10	-3	-1		

WANTED — VIC

● MINI BCB & SW aerial coils, 455 kHz IFs for use in valve gear. Aegis, O-Plus, Kingsley types or equiv. Mini tuning capacitors 10-415 pF: 1, 2, 3, 4, gang types, Robin, Eddystone, Plessey, Polar etc. Valves types: 1H5GT, 1Q5GT, 1P5GT, 3S4, 3V4, 1T4, 1R5, 1S5, 1U5, 12AD6, 12AE6, 12AL6, 12BL6, 12D6, 12EM6, 12FK6, 12FM6, 12K5. Bruce VK3YSW (03) 527 2661 after 6pm QTHR.

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● VZ200-VZ300 serial interface complete or pcb only VK4KAL QTHR (079) 85 4188.

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